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Draft Environmental Assessment

Brite-X Mica Processing Plant

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Custer County, South Dakota**

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1.0 INTRODUCTION

Pacer Corporation (Pacer) of Custer, South Dakota has submitted a proposal to the United States Department of Agriculture Forest Service (Forest Service) to construct a processing plant and ancillary facilities on Forest System land to process mica. This Environmental Assessment has been prepared by the Forest Service to evaluate the effects of their proposal and determine how this proposal should be implemented on Forest System land as provided by mining laws, rules, and regulations. The historical and modern mining laws, rules, and regulations are frequently misunderstood so they are summarized in this section to allow the public a better understanding of how the Forest Service is legally required to manage mining activities. This section also describes the public review process and the issues and concerns that were identified.

1.1 BACKGROUND

The Brite-X mine is located six miles northwest of Custer, South Dakota, on Forest System lands in the SW¼ of sec. 28, T. 2 S., R. 4 E. (Figure 1). Access is from U.S. Highway 16/385 through a legal easement across private land administered by the Myrle Case Trust Wells Fargo PCC Trustee (hereafter identified as the Case Estate) in the Tenderfoot Creek drainage. The road from U.S. Highway 16/385 is gated and there is no public access to the Brite-X mine. There are 0.8 miles of access road across private land and 0.3 miles of access road across Forest System lands. Pacer currently has a total of 19 contiguous, unpatented lode mining claims surrounding the Brite-X mine. The mining activities are anticipated to last a minimum of 50 years based on the current understanding of the geology of the area.

The Brite-X mine was first discovered and claimed by Pacer in 1978. Pacer submitted a plan of operation and the Forest Service completed an Environmental Assessment on July 6, 1978. The mine is also permitted through the State of South Dakota under Large Scale Mine Permit No. 311. The original operating plan and bond requirements have been amended several times and currently the State of South Dakota retains a \$31,700 reclamation bond for the Brite-X mine. Mining activity has consisted of the development of a small open pit, crushing facility, and staging area totaling approximately 5.5 acres in size on unpatented lode mining claims. The mica rich rock mined at the Brite-X is transported to Custer, South Dakota, and processed in a timber mill that has been converted to process mica. Much of the equipment is old and antiquated and local citizens have voiced concerns with the noise and dust produced by the current facility.

With the increased demand for their mica product, the current processing plant in Custer, South Dakota, was identified as inadequate to meet projected demands. The decision was made to construct a new processing plant and in January 2002 Pacer met with the Forest Service to discuss building at the Brite-X mine. In September 2002, Pacer submitted an operating plan to the Forest Service to develop a processing plant, warehouse and packaging facility, fuel facility, and parking area adjacent to the existing mine on one of the unpatented mining claims.

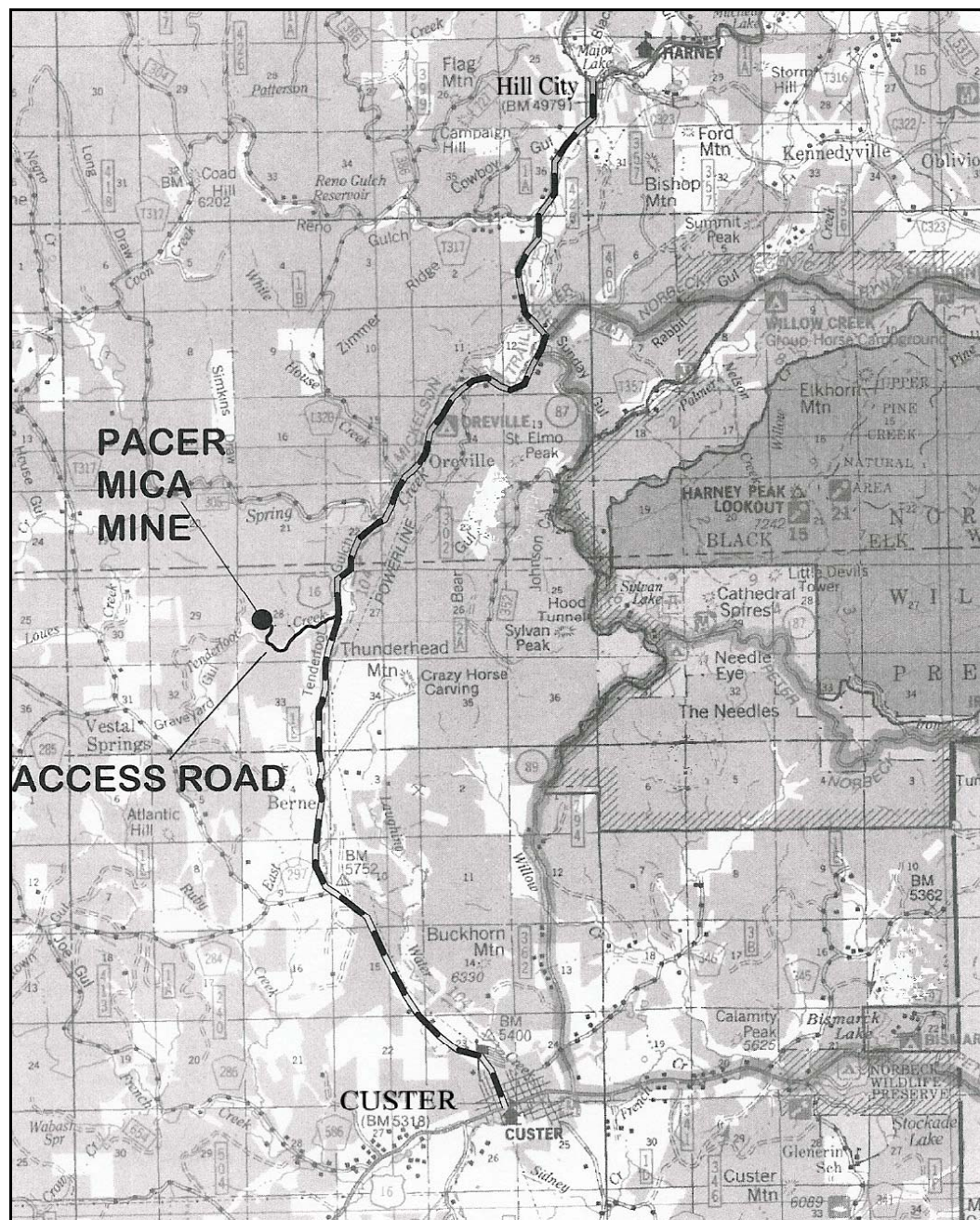


Figure 1: Location map of Brite-X Mine and proposed processing facilities.

1.2 MINING ON FEDERAL LANDS

Pacer has submitted their proposal based on legal rights guaranteed by the General Mining Law of 1872. This law allows citizens to access Federal lands to search for and remove locatable minerals and gain a “possessory right” to these mineral resources. These possessory rights are initiated through the discovery of a mineral resource and staking of a mining claim. Once the claim is staked and legally recorded, the citizen has the right to use the surface of the claim for mining purposes of exploration, mining, and

processing. A mining claim is a type of private property with an associated “bag of rights” in which the claimant owns the mineral rights.

The Mining Law of 1872 is still in effect and has been modified by the Multiple Use Mining Act of 1955 which place limitations on a citizen’s surface rights and gives authority of the management of surface resources to the Forest Service. Specific rules and regulations were developed in 1974 and are described under Title 36 Part 228 of the Code of the Federal Regulations for Minerals (36 CFR 228). Prior to 1974, there were no requirements for citizens to inform the Forest Service of what they planned to do or to reclaim disturbed areas. These new regulations provided the means to manage the surface effects of mining activities, and the constitutionality of the regulations has been tested several times in court and upheld. These regulations require the submission of a Plan of Operation for all activities that are likely to cause a significant surface disturbance and posting of a reclamation bond.

The surface effects of mining activities are evaluated through procedures stipulated in the National Environmental Policy Act of 1969 (NEPA). The intent of NEPA is to ensure that federal decisions consider the effects on the environment and that the decision making process is open and visible to the public. When a mining proposal is received by a Federal Agency, a decision is made whether the proposal will significantly affect the quality of the natural and physical environment and the relationship of people with the environment. Typically the effects are unknown and an Environmental Assessment (EA) is prepared to allow the agency to determine whether an Environmental Impact Statement (EIS) is required. The EA typically includes a brief discussion for the need for the proposal, description of alternatives, and discloses the expected direct, indirect, short- and long-term cumulative environmental impacts of each alternative. The analysis is completed by an Interdisciplinary Team (IDT) of individuals representing the different resource areas such as air, water, soil, wildlife, etc. The EA should be of sufficient length to ensure that the decision is sound, but should not attempt to be a substitute for an EIS. The Federal decision concerning the proposed action is then documented in a decision notice. A finding of no significant impact (FONSI) is completed, if no significant impacts are identified in the decision notice. If significant impacts are identified that cannot be mitigated, the Federal agency must complete an EIS.

The Forest Service will issue a decision notice in which the deciding official selects an alternative that will be implemented through an updated Plan of Operation. A reclamation bond amount is calculated and the operator files an acceptable bond instrument with the Forest Service (36 CFR 228.13). The initial Plan of Operation is then updated to reflect management requirements, constraints, mitigation measures, monitoring, reclamation, and closure requirements. It is under this general legal framework that Pacer’s proposal to build and operate a processing plant and ancillary facilities will be evaluated by the Forest Service.

1.3 PURPOSE OF AND NEED FOR ACTION

The underlying purpose and need for Forest Service action and decision is provided by the laws governing locatable mineral activities on National Forest System lands. These laws provide that the public has a statutory right to conduct prospecting, exploration, and development activities (1872 Mining Law; 1897 Organic Act) provided they are

reasonably incident (1955 Multiple Use Mining Act) to mining and comply with other federal laws. They also direct the Forest Service to regulate such activities (1897 Organic Act; 36 CFR 228 Subpart A) for the purpose of minimizing adverse environmental effects (36 CFR 228.1) provided such regulation does not endanger or materially interfere with prospecting, mining or processing operations or reasonably incident uses (1955 Multiple Use Mining Act).

1.3.1 Forest Service Rules and Procedures

In 1974, the Forest Service set forth rules and procedures under Title 36 Part 228 of the Code of the Federal Regulations (36 CFR 228) regulating the use of the surface of National Forest lands in connection with operations authorized by mining laws. As described in section 228.1:

It is the purpose of these regulations to set forth rules and procedures through which use of the surface of National Forest System lands in connection with operations authorized by the United States mining laws (30 U.S.C. 21-54), which confer a statutory right to enter upon the public lands to search for minerals, shall be conducted so as to minimize adverse environmental impacts on National Forest System surface resources. It is not the purpose of these regulations to provide for the management of mineral resources; the responsibility for managing such resources is in the Secretary of the Interior.

Chapter 2800 of the Forest Service Manual explains the mining law and Forest Service policy on mining:

Under the Mining Law of May 10, 1872, except as otherwise provided, all valuable mineral deposits, and the lands reserved from the public domain for National Forest purposes in which they are found, are free and open to exploration, occupancy and purchase under regulations prescribed by law. The objective of the Forest Service in the administration of its minerals program is to encourage and facilitate the orderly exploration, development, and production of mineral and energy resources within the National Forest System. The Forest Service must also ensure that the development of mineral resources are conducted in an environmentally sound manner, and that lands disturbed by mineral activities are reclaimed for other productive uses. The statutory right of the public to prospect, develop, and mine valuable minerals will be fully honored and protected. It is the Forest Service policy to recognize mineral development can occur concurrently or in sequence with other resource uses.

1.3.2 Forest Plan Direction

The Black Hills National Forest (Forest) is implementing the 1997 Revised Land and Resource Management Plan (Forest Plan) as amended by the Phase 1 Amendment signed on May 18, 2001, and associated Final Environmental Impact Statement for the Black Hills National Forest Land and Resource Management Plan (1996). This Environmental Assessment is tiered to the Forest Plan and information from the Forest Plan has been incorporated into this document.

The Black Hills National Forest Plan includes multiple-use goals and objectives for management of the Forest and provide for sustained commodity production, the protection of basic resources, wildlife diversity, scenic quality, recreational opportunities, and heritage resource protection. The Forest Plan specifically states that the Black Hills National Forest will provide for sustained commodity use in an environmentally acceptable fashion (Goal 3) and promote rural opportunities (Goal 8). Pacer's proposal to develop a processing plant and ancillary facilities at the Brite-X Mine are consistent with the goals identified in the Forest Plan.

The Black Hills National Forest Plan has assigned a management emphasis to each portion of the Forest to meet multiple-use objectives. The Forest Plan describes future condition, goals and objectives, and standards and guidelines for each management area. The Brite-X mine is located in management area 5.1 which is characterized as:

5.1 RESOURCE PRODUCTION EMPHASIS

Theme – These areas are managed for wood products, water yield, and forage production, while providing other commercial products, visual quality, diversity of wildlife, and a variety of other goods and services. Numerous open roads provide commercial access and roaded recreational opportunities, while closed roads provide non-motorized recreational opportunities.

The Forest Plan provides multiple-use standards and guidelines for the management of the Forest. These standards and guidelines are described in Chapters 2 and 3 of the Forest Plan. They include protecting basic resources, providing a variety of life through diverse ecosystems, providing for scenic quality, recreational opportunities and heritage resource protection.

The Forest Plan also provides a monitoring and evaluation strategy. In Chapter 4 a conceptual framework for monitoring and evaluation is described and the specific criteria are found in the annual monitoring reports. The latest criteria used for monitoring are described in the *Black Hills National Forest Monitoring Implementation Guide* (USDA Forest Service, 2002).

Besides these specific standards and guidelines, the Forest Plan incorporates by reference the Best Minerals Management Practices identified in Appendix 4 of the Forest Plan. These practices are outlined in the document: *Best Minerals Management Practices – A Guide to Resource Management & Reclamation of Mined Lands in the Black Hills of South Dakota* (1985). This document was prepared through the cooperative representation of the mineral industry; South Dakota Department of Game, Fish, and Parks; South Dakota Department of Water and Natural Resources; and the Black Hills National Forest. It is updated on an as needed basis.

1.3.3 South Dakota Rules and Regulations

The State of South Dakota (the State) has the authority to issue mine permits under the South Dakota Mined Land Reclamation Act (1989) and the South Dakota Mined Land Reclamation Rules (1989). These permits are necessary for operation on federal, state, and private land within the State of South Dakota. The State of South Dakota Department of Environment and Natural Resources (DENR) is responsible for the approval of all mine permits and their administration. A reclamation plan and bonding are required before the approval of the mine permit. Pacer currently has a large scale

mine permit for the operation of the mine and has a bond to cover the cost of hiring a third party contractor to conduct reclamation activities. The DENR will require an additional mine permit and bond for the operation of the proposed mica processing plant.

The United States Forest Service and the State of South Dakota have a Memorandum of Understanding (1986) for the management of mining activities in the Black Hills. This document describes the responsibilities of both parties and identifies the procedures that will be used to administer mining activities in the Black Hills. An operator on Forest System lands will submit a bond that is deemed adequate by the State and the Forest Service to cover the cost of reclamation activities. This bond will be issued and held in the name of the State of South Dakota. This bond will be released when the reclamation requirements stipulated in the Forest Service approved plan of operations and the State mine permit are completed. The Forest Service and the State also have the authority to request additional bonding, if at any time either party feels that the reclamation bond is inadequate for the protection of Forest System land or is inconsistent with State or Forest Service policies or regulations.

The State of South Dakota also has regulatory authority for the protection of air and water resources. The DENR Air Quality Program will require a new air quality permit for the operation of the new mica processing plant. Plans and specifications will need to be submitted to DENR Ground Water Quality Program for the installation of the fuel facility. The DENR Surface Water Quality Program will require plans and specifications for the sewage disposal system. A stormwater pollution prevention plan will need to be submitted to the DENR Surface Water Discharge Program. The domestic water well will require a State water right permit.

Custer County Ordinance #2 requires that all industrial uses and structures be approved by the County Commission. Custer County also requires a Building Permit for the construction of the proposed facility and a Wastewater Disposal Permit for the installation of a septic system.

1.4 PROPOSED ACTION

Pacer Corporation's proposed action is to develop a processing facility at the Brite-X mine site. The site is located in the SW¼ of sec. 28, T. 2 S., R. 4 E., the total area of disturbance is 1.5 acres, the activity will occur on one unpatented mining claim, and the proposed action is approximately 50 years in duration.

Processing Plant

The processing plant at the Brite-X mine will consist of a steel-supported metal building approximately 12,500 square feet in size on a reinforced concrete slab. The roofline is estimated to be 35 feet in height and the building will be insulated for sound dampening. The processing plant is the heart of the mining operation and is where the mica is crushed and sorted to meet the different product specifications.

The processing plant will produce 15,000 to 18,000 tons of finished mica product per year. The design is modular in nature where additional capacity can be added without disturbing the existing plant operations. Good dust collection and dust collector maintenance are critical to the production of mica. The very finest dust particles are the most desirable and expensive finished mica product. It is in the direct interest of Pacer

Corporation to limit the emissions from the processing plant by collecting as much of these mica particles as is technically feasible.

The processing plant uses an entirely dry grinding process and does not use any water or other chemicals. Dust is collected by a conventional bag type collection system that transfers the dust to a dust collector unit through a vacuum and piping system. The particulates are trapped in fine mesh “socks” and at predetermined intervals this material is shaken into the bottom of the dust collector unit. It is then removed by devices called rotary air locks and transported to surge tanks for processing into finished products. The existing processing plant at Custer, South Dakota, has six dust collector units containing a total of 673 bags. The new processing plant would have six or seven dust collector units but because they are much larger in size they would contain nearly 1200 bags.

Warehouse/Packaging Facility

The finished mica product will be pneumatically conveyed from the processing plant to the adjacent warehouse/packaging facility where it is placed into 50-pound paper bags or large bulk bags for distribution. This facility will consist of a steel building approximately 15,000 square feet in size and include areas for bagging, storage, truck loading, and an office area for management of the facility. Some finished product will be stored in a silo for bulk truck loading. Each corner of the processing plant and warehouse/packaging facility, truck loading area, and the truck scale will have an external light source.

By-products

The by-products from the processing plant consist of non-mica accessory minerals such as quartz. These accessory minerals may be sold in secondary markets. Any by-products that remain in excess of these sales will be stockpiled on site and used in the reclamation of the Brite-X mine.

Noise

Noise levels measured outside of the existing processing plant in Custer, South Dakota, were in the range of 70-75 dba. It is anticipated that the noise levels of the proposed facility will be in a similar range.

Fuel

The fuel that will be used at the processing plant will include propane, diesel fuel, and gasoline. The Propane will be stored in four 1000-gallon tanks and the diesel fuel and gasoline will be stored in 500-gallon, above ground, storage tanks. The propane tanks will be mounted on a concrete pad. The liquid fuels will be placed in a concrete walled containment area that is capable of holding 110 percent of the largest tank. The fuel island will be covered with a corrugated steel roof to keep rain and snow from accumulating in the containment area. No other hazardous materials will be used at the proposed facility.

Power

Electrical power will be brought to the site via a 24.9/14.4 kV overhead power line approximately 0.8 miles in length (See Figure 2). This spur will connect with a new underground power line that will be located on the west side of Highway 16/385.

Other Associated Facilities

Current plans for sewage disposal include the installation of a certified underground holding tank that will be pumped at regular intervals by a commercial pumping business. A certified truck scale, domestic water well (capacity of 20 gallons per minute), stormwater sediment ponds, parking area, and unloading/loading area will also be constructed to support the processing plant.

Transportation

The finished product is transported to Pacer's customers using federally regulated highway trucks pulling either flat beds or vans with gross vehicle weights up to 84,000 pounds. The truck scale will be used to determine the finished product shipping weights for all highway trucks that leave the site. These trucks will access the site from Highway 16/385 onto the access road through the private land of the Case Estate.

Only the employees of Pacer Corporation and services such as propane delivery, delivery of supplies, Federal and State regulatory agency visits; and highway trucks transporting finished product will use the access road. The hours of usage will generally be from 6 a.m. to 5 p.m. The existing road will be maintained but not expanded. The entrance from Highway 16/385 will be gated and locked during non-business hours and signs will be posted informing of private usage and no through traffic conditions. Traffic lights will be placed at both ends of the access road and controlled to allow one-way flow of traffic up and down the road.

Reclamation

The mining activities have currently disturbed 5½ acres. Of this total, 3½ acres is the mine, and it drains into itself. The other two acres are a staging area and the coarse mica stockpile. The proposed processing plant will impact another estimated 3¼ acres during construction. To develop the proposed processing facility up to 150 trees will need to be cut and removed as part of the clearing and grubbing. All merchantable timber will be purchased according to Forest Service rules and regulations. Disturbed areas such as settling ponds and soils stockpiles will be revegetated after the completion of construction activities. Upon completion of the construction activities the proposed processing facility will occupy a total of 1½ acres.

When the project is completed all disturbed areas will be reclaimed. The structures and equipment will be entirely removed from the site due to the use of pre-fabricated metal and not reinforced concrete. The concrete slabs of the buildings, fuel facilities, and asphalt in the parking lot will be broken and removed. The septic tank will be removed and backfill the void. Because the topography is relatively flat, the topsoil can be replaced and the entire area of disturbance can be re-graded to an approximation of the original topography. The site will be re-seeded with a Forest Service approved mixture of grasses and forbs.

1.5 PUBLIC INVOLVEMENT

The Brite-X Mica Processing Plant proposal was provided in written form and mailed to the public and other agencies for comment from October 4, 2002, to November 4, 2002. This information package was mailed to 192 individuals/or groups on October 4, 2002.

Public notices were submitted to local news organizations and articles were published in the October 9, 2002, edition of the Custer County Chronicle and the October 15, 2002, edition of the Rapid City Journal. A total of 26 comments in the form of letters, e-mail, or telephone calls were received during the comment period. A list of issues was developed using the comments from the public, other agencies, and the members of the Forest Service Interdisciplinary Team. A meeting was held on October 22, 2002, to discuss Pacer Corporation's proposal with representatives from the Forest Service Interdisciplinary Team, State of South Dakota Department of Environment and Natural Resource Minerals and Mining Program, and State of South Dakota Game, Fish, and Parks.

1.6 ISSUES

An issue is a concern based on the potential effect of the proposal on a physical, biological, social, or economic resource. An issue is not an activity, but instead, the predicted effects of the activity are what create an issue. The issues collected during the scoping period are categorized into three groups: relevant issues, tracking issues, and unrelated issues.

Relevant issues provide the focus for the analysis. Relevant issues are those that influence the decision, suggest new alternatives, or require different actions and mitigation. These issues are studied in detail and are addressed through the proposed action, mitigation measures, and design criteria.

Tracking issues do not meet the criteria of relevance, but were identified as important to track. Tracking issues are generally of high interest or concern to the public or are necessary to understand the full extent of the alternatives. Tracking issues provide additional information for the analysis but do not drive the formulation of alternatives. Project design features or mitigation measures address these concerns.

Unrelated issues are outside the scope of the proposed action and are not used in the development of alternatives. These issues may already be decided by law, regulation, Forest Plan, or other higher level decisions; irrelevant to the decision to be made; or may be conjectural and not supported by scientific or factual evidence (Council for Environmental Quality NEPA regulations sec. 1501.7).

1.6.1 Relevant Issues

Stormwater runoff may impact Tenderfoot Creek (Water)

The potential sedimentation and hydrocarbon contaminants associated with stormwater runoff from the construction and operation of the proposed processing plant may affect Tenderfoot Creek habitat and the aquatic biota. This issue is common to all alternatives and was integral in the development and selection of the preferred alternative. The proposed mitigation measures for the preferred action are discussed in further detail in Chapter 2.

Errant fly rock from blasting activities at the mine may compromise the safety of the employees who will work at the proposed processing plant (Safety)

The location of the proposed facilities may create unsafe conditions during blasting activities. Regulatory control for the safety of employees at a mining operation is the responsibility of the U. S. Department of Labor Mine Safety and Health Administration. The Forest Service will still evaluate the general effects of the location of the proposed facility as applied to worker safety.

1.6.2 Tracking Issues

Cattle may be killed by trucks using the access road to reach the proposed processing plant (Range Resource)

The mine has been in operation for 30 years and there have been no reported accidents between cattle and vehicles using the access road. If conflicts develop between cattle and vehicles, the Forest Service has a variety of options for the management of range resources that can be implemented to address this issue. This issue did not help in the development of alternatives and the proposed mitigation measures are the same regardless of alternative.

Dust from the operation of the processing plant may impact the Forest and nearby residents (Air)

Regulatory control of air quality is the responsibility of the State of South Dakota Department of Environment and Natural Resources Air Quality Division. The Forest Service will still evaluate the environmental effects of the proposed mica processing plant on air quality, but the State of South Dakota has regulatory responsibility for air quality and issues the air permits for such activities as the operation of this mill. This issue did not help in developing alternatives and the proposed mitigation measures are the same regardless of alternative.

The intersection of Highway 16/385 and the mine access road is dangerous due to limited sight distances from southbound traffic (Transportation)

The State of South Dakota Department of Transportation has regulatory authority and responsibility for this issue. Currently they believe that this intersection does meet the legal requirements for a safe sight distance. They plan to improve the sight line along Highway 16/385 to exceed 600 feet visibility and post "Truck Entering" signs to the north and south of the highway (D. Krause, Personal Communication, 2002). This issue did not help in the development of alternatives and the proposed mitigation measures are the same regardless of alternative.

Any activities within the area nominated for the federal historic property register may compromise the historic integrity of this site (Cultural)

Historic properties have been taken into consideration pursuant to Section 106 of the National Historic Preservation Act. It has been determined that historic properties will

not be affected by this undertaking. The South Dakota Historic Preservation Office and concerned Native American governments have had the opportunity to comment on this proposed undertaking submitted by the Forest Service. The alternatives listed in this environmental assessment have considered historic properties. A summary of Section 106 compliance fulfillment is described in Chapter 3 of this Environmental Assessment. Any inquiries involving historic properties and this undertaking all inquiries should be directed to the Black Hills National Forest Archeologist.

1.6.3 Unrelated Issues

It is not in the public interest to place a processing plant on federal land

When a citizen holds a legally staked and recorded mining claim, they have a legal right to the locatable minerals and the use of federal land for the purposes of prospecting, exploration, development, and production. Processing facilities are typically constructed in the production phase of a mining operation and has been an established practice since the implementation of the Mining Law of 1872. This concern is outside of the scope of the Environmental Assessment and will not be studied in detail or discussed in the analysis.

The bonding may not be adequate for reclamation of the site

Bonding is determined after the NEPA process is completed. There are established procedures to ensure the reclamation of mine sites and each operator is bonded as described in the Memorandum of Understanding between the U.S. Forest Service and the State of South Dakota (1986). Bond calculations include an adjustment for inflation over the life of the project and are periodically revisited over the life of the operation. This concern will not be studied in detail or discussed in the analysis and is outside the scope of the Environmental Assessment.

The Forest Service should not approve this proposal because it will financially benefit Pacer Corporation

The Mining Law of 1872 and other associated federal legislation and regulations allow this activity on federal land and Pacer's economic benefit is irrelevant to the proposed decision. Pacer is responsible for the financial investment of proposed facilities. This concern will not be studied in detail or discussed in the analysis and is outside of the scope of the Environmental Assessment.

The plants in an existing settling pond may be considered wetland species and require mitigation

The Interdisciplinary Team has determined that this settling pond cannot be classified as a wetland. It was designed and built as a stormwater retention pond at the request of the Forest Service and State of South Dakota to mitigate potential stormwater impacts to Tenderfoot Creek for the existing mine operation. This concern will not be studied in detail or discussed in the analysis.

1.7 DECISION FRAMEWORK

The federal action being considered is the Forest Service decision to approve as submitted, or require changes before approving, the proposed plan to develop and operate a mica processing plant and ancillary facilities at the Brite-X mine. To authorize or deny the proposed mineral operation is not part of the decision, since the existing laws as intended by Congress authorize mineral related activity on National Forest. The Hell Canyon District Ranger will make a decision based upon the information disclosed in this Environmental Assessment, associated project record, and public feedback. The decision to be made is “under what conditions may this proposal be implemented on National Forest land to ensure that mining operations will be conducted in an environmentally acceptable manner.” This decision will be documented in a Decision Notice.

1.8 DOCUMENT STRUCTURE

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the development and operation of a mineral processing plant and ancillary facilities at the Brite-X mine. This document is organized into four parts:

Chapter 1.0 - Introduction: The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2.0 – Evaluation of Alternatives: This section provides a more detailed description of the agency’s proposed action and alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3.0 – Affected Environment and Environmental Consequences: This section describes the environmental effects of starting the proposed action and other alternatives. This analysis is organized by environmental component. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

Chapter 4.0 - Agencies and Persons Consulted: This section provides a list of Interdisciplinary Team members and agencies consulted during the development of the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record at the Hell Canyon Ranger District Office in Custer, South Dakota.

2.0 EVALUATION OF ALTERNATIVES

This chapter describes and compares the alternatives evaluated for Pacer Corporation's proposal to construct a processing plant and ancillary facilities on Forest System land. The Forest Service has the responsibility of developing reasonable alternatives that meet the purpose and need for action, address legal requirements or resource issues, and minimize adverse environmental effects. These alternatives should provide different response(s) to the relevant issue(s) identified in the analysis and be technically and economically feasible. There are five types of alternatives that may be reviewed in an EA: (1) No-Action; (2) Proposed Action; (3) Preferred Action; (4) Alternative Action; and (5) Alternatives Evaluated But Eliminated From Further Study.

1. The No-Action alternative is required by NEPA and is used as a baseline against which impacts of the various action alternatives can be measured and compared.
2. The Proposed Action is typically the proposal submitted by the project proponent.
3. The Preferred Action is the action developed by the agency's Interdisciplinary Team or the Proposed Action.
4. Other actions that also address significant or relevant issues are considered Alternative Actions.
5. Alternatives that the Interdisciplinary Team identified that were not responsive to the relevant issues identified in the analysis, did not minimize adverse environmental effects, or did not address legal requirements or resource issues are considered Alternatives Evaluated But Eliminated From Further Study.

This evaluation was completed by an Interdisciplinary Team of Forest Service staff members representing the various resource areas. The Interdisciplinary Team identified the potential impacts from stormwater runoff to Tenderfoot Creek and errant fly rock from blasting activities as relevant issues. These issues guided the development and evaluation of the different alternatives studied by the Interdisciplinary Team. These alternatives are described in comparative form to define the differences between each alternative and provide the decision maker and public a clear basis for choosing among the five alternatives (See Figure 2).

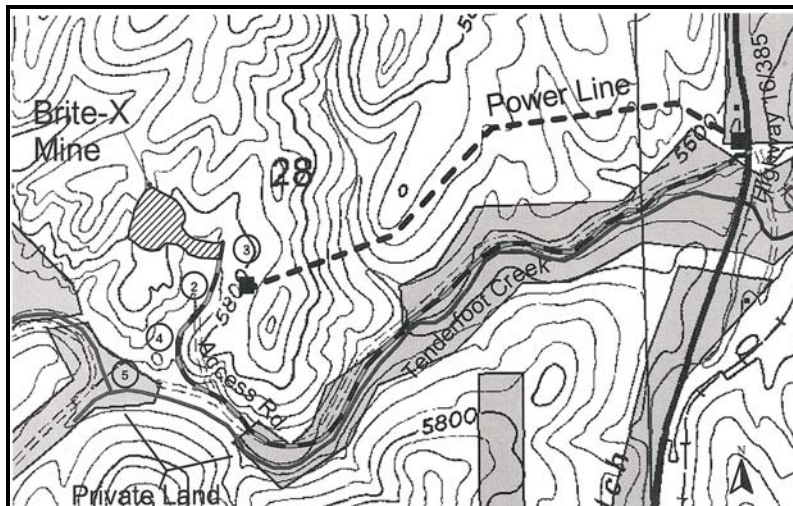


Figure 2: Location map for different alternatives. Alternative 1 is not shown. Alternatives 2 – 5 identified by corresponding numbers.

2.1 ALTERNATIVES

2.1.1 No Action - Alternative 1

This alternative assumes that the existing mining operations would continue and that the mica ore is transported and processed off Forest System lands at the existing processing plant in Custer, South Dakota. No overhead electrical power line will need to be developed in this alternative. Currently the total developed area is 5.5 acres and all existing work areas, roads, and settling ponds would remain in place (Figure 3). Current management plans would continue to guide the management of the project area under the No-Action alternative.

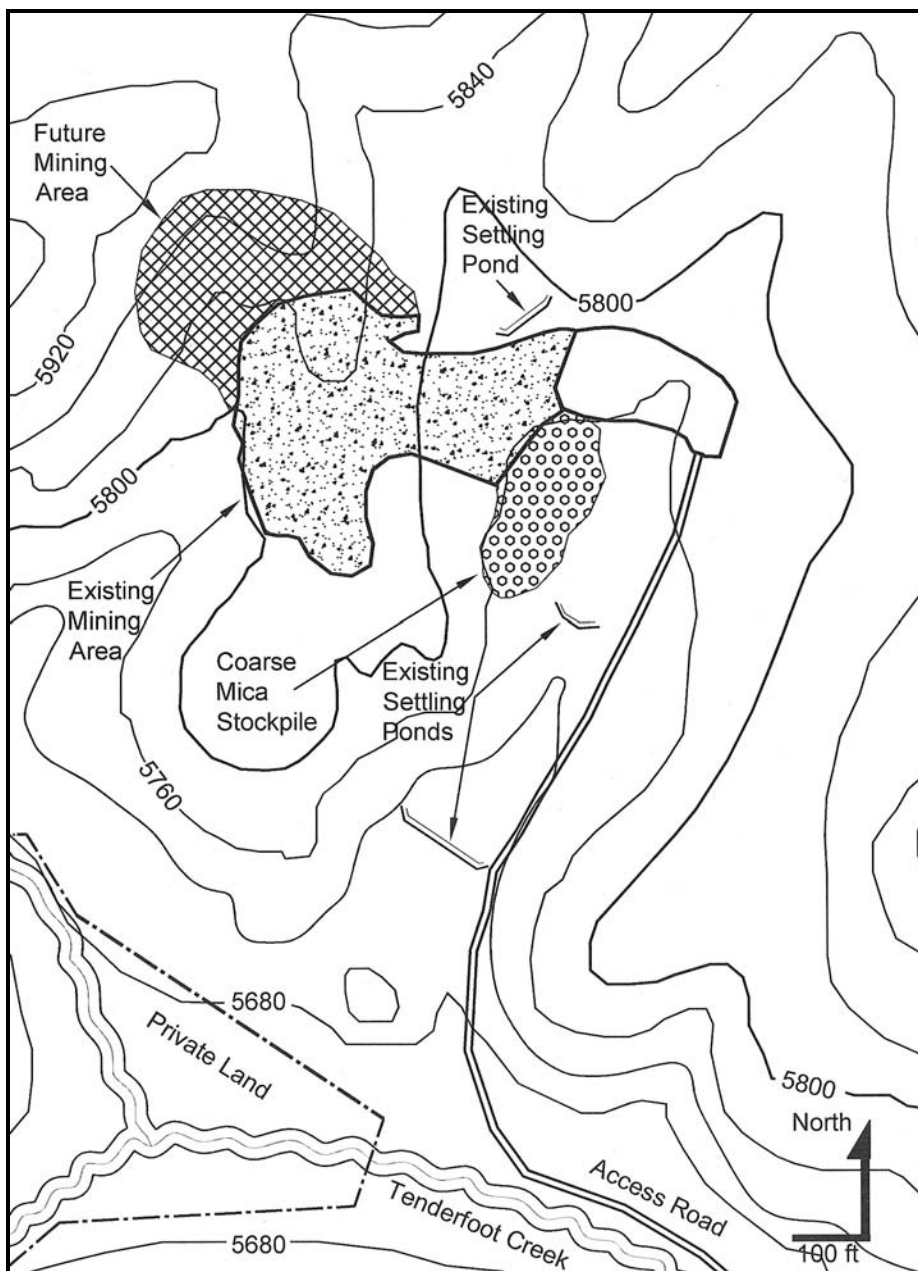


Figure 3: Existing conditions under the No Action - Alternative 1.

As previously stated, the laws and policies guiding mineral development do not give the Forest Service discretion in selecting this alternative. The No-Action alternative serves as a baseline against which the impacts of the various action alternatives can be measured and compared.

2.1.2 Preferred Action – Alternative 3

Pacer submitted a Plan of Operation describing their original action in September 2002. The Interdisciplinary Team reviewed this alternative (Alternative 2) and identified a number of issues and concerns with the proposed site for the processing facility. The Interdisciplinary Team determined that to mitigate potentially adverse environmental effects the processing plant should be located near the top of the existing drainage. The Interdisciplinary Team chose a site next to the existing parking area at the Brite-X mine in consultation with Pacer Corporation (Figure 4). Pacer Corporation submitted a new operating plan reflecting this new location at the request of the Forest Service on October 15, 2002.

Pacer proposes to develop and operate on National Forest System land:

- a processing plant consisting of a single structural steel building of approximately 12,500 square feet in size;
- a warehouse/packaging facility consisting of a single structural steel building approximately 15,000 square feet in size;
- other associated facilities such as fuel storage, certified truck scale, domestic water well, septic system, stormwater sediment ponds, parking area, and unloading/loading area.
- build a 24.9/14.4 kV overhead power line approximately 0.75 miles in length to support the processing and warehouse/packaging facility;
- and the facility will operate for approximately 50 years.

The processing plant will be located on a gently sloping, forested area, directly east of the existing parking lot. Up to approximately 150 trees will be cut from this area and minimal topsoil will be excavated to create a level building site. This topsoil will be placed in a stockpile for later reclamation of the site.

The existing parking lot will be converted to meet the operational requirements of the new facility and will limit the total amount of new disturbance to a total of 1.5 acres. The existing parking area will be paved with asphalt and become the loading/unloading area, employee parking, and truck scale. One new settling pond and a fuel storage area will be constructed north of the paved parking area. The two existing settling ponds in the drainage below the open pit and existing parking area will remain in place. Short-term erosion control during construction will consist of a two-tier effort. Silt fencing will be installed above the construction site to inhibit or minimize the flow of stormwater onto the site. Silt fencing will be installed at the south end of the site below the construction to prevent sediment from being transported into Tenderfoot Creek. Surface water runoff at the mine/mill site will be directed into settling ponds.

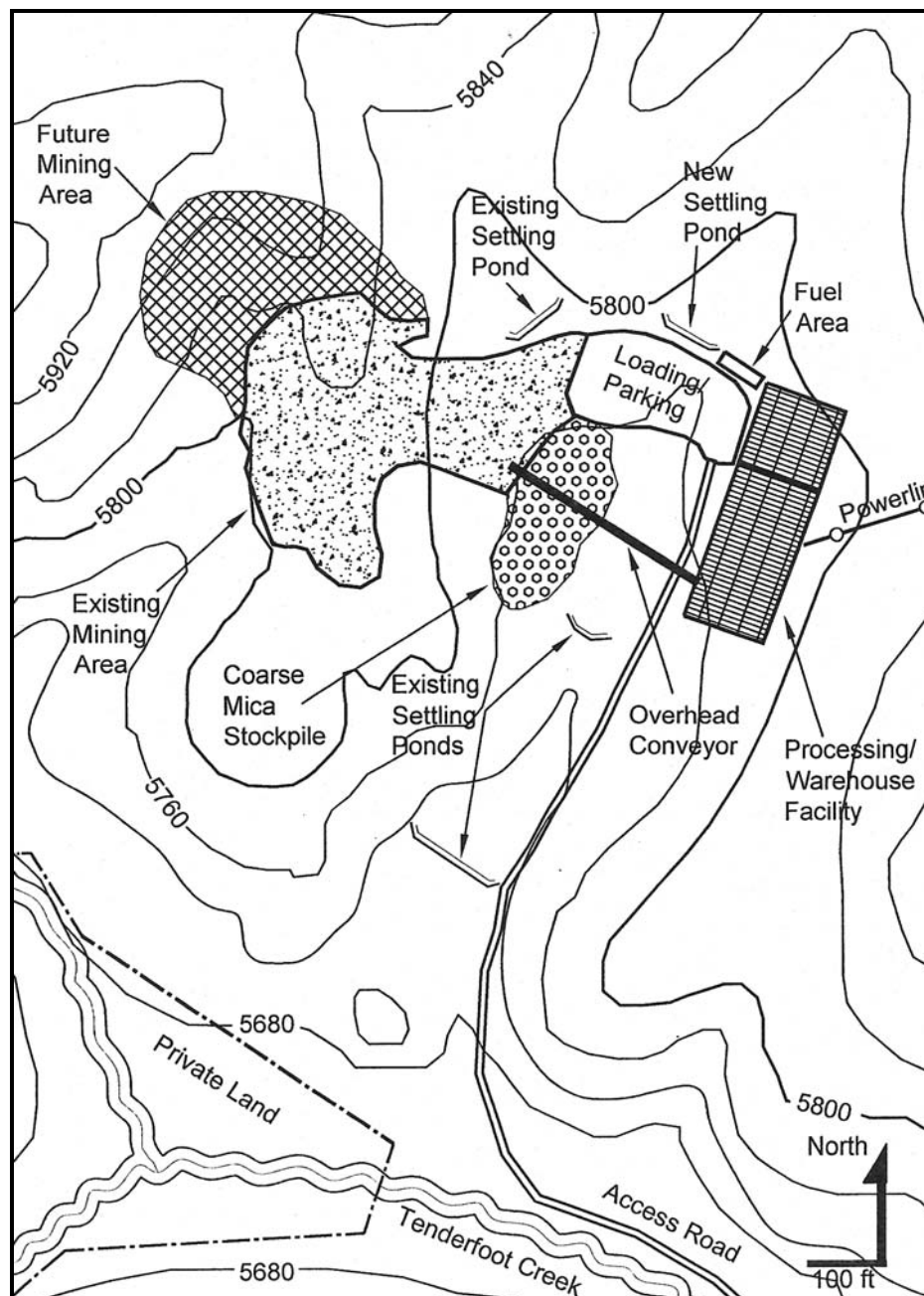


Figure 4: Site plan of Preferred Action - Alternative 3.

2.1.3 Alternatives Evaluated But Eliminated From Further Study

Original Action - Alternative 2

This alternative was the original Plan of Operation submitted by Pacer to the Forest Service in September 2002. The original action was developed to meet the objectives for a profitable mining operation but did not necessarily consider the objectives, goals, standards, and guidelines of the Forest Plan.

Pacer proposed to locate the processing plant within the drainage below the existing open pit mine (Figure 5). The ridge to the west would serve as a shield or barrier to the facility and would protect the proposed facility and workers from accidental flying rock created during blasting operations. This action would require the excavation of soil and rock to create a level site for the processing plant. The total area of disturbance is approximately 2 ½ acres in size.

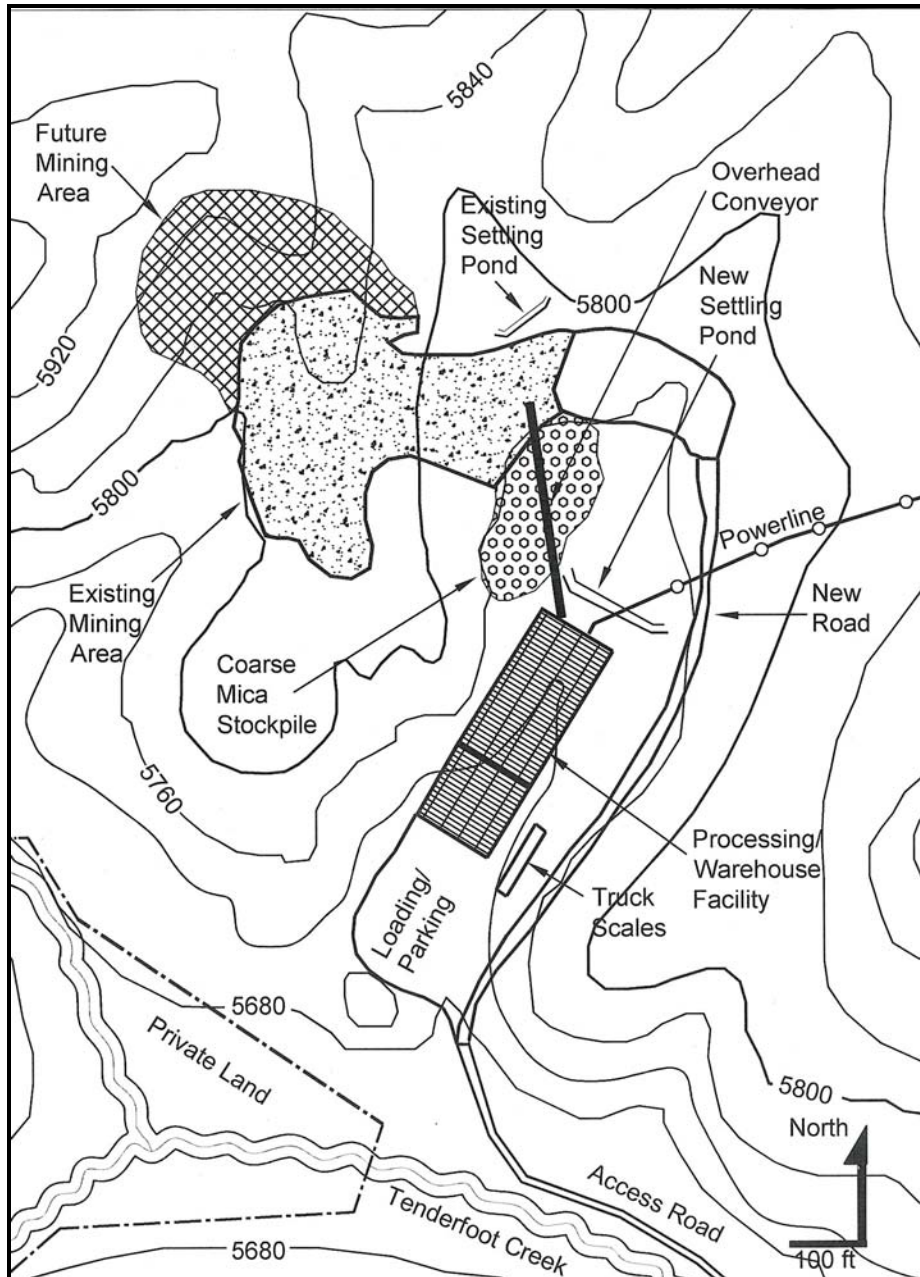


Figure 5: Site plan of Original Action - Alternative 2.

The Interdisciplinary Team identified several concerns with this proposal. This plan would require excavating into the east side of the drainage approximately 100 feet to create a level building site. The total volume of soil and rock would be extremely large and a nearly vertical rock wall 90-foot in height would be created on the east side of the drainage. This plan would completely alter the existing drainage and eliminate the existing settling pond currently used to mitigate potential impacts to Tenderfoot Creek. Fly rock also follows arching paths and go over the ridge and land on the facility. Consequently, the ridge would be only a partial shield from fly rock generated during blasting activities.

This alternative did not reduce potential adverse environmental effects but may have actually increased the potential for environmental effects. The small drainage would be permanently altered and the benefits of using the existing settling ponds to mitigate stormwater runoff would be eliminated. The site could only be partially reclaimed because the vertical rock wall on the east side of the drainage would remain in perpetuity. The Interdisciplinary Team did not consider this alternative responsive to the potential impacts from stormwater runoff to Tenderfoot Creek. Pacer was informed of the Interdisciplinary Teams concerns associated with this action and they agreed that this action should be eliminated from further study

Alternative 4

In an attempt to reduce the necessary earthwork to develop the processing plant, the bottom of the drainage next to Tenderfoot Creek was investigated by the Interdisciplinary Team. This site would be further away from blasting operations, protected by the ridge, and the workers would be much safer from errant fly rock. The team determined that although the disturbance would be considerably less, the close proximity to Tenderfoot Creek would increase the potential for stormwater impacts and possibly create additional adverse environmental impacts. This alternative was not considered feasible so it was eliminated from further study.

Alternative 5

The Interdisciplinary Team also reviewed Pacer Corporation's proposal to locate the processing plant on private land of the Case Estate. This site was originally selected by Pacer, because it was a safe distance from blasting operations and would not require any mitigation to protect the workers. Pacer submitted an offer to purchase land from the Case Estate for the proposed facility and the offer was refused in December 2001. The Interdisciplinary Team determined that the potential impacts from stormwater runoff and the potential to create additional adverse environmental impacts were nearly identical to Alternative 4. This alternative would also require the construction of additional road on Forest System land to reach the proposed facility. This alternative was not considered feasible so it was not evaluated.

2.2 MITIGATION

Stormwater runoff impacts to Tenderfoot Creek (Water)

Indicator

Visual evidence of discharge of water from settling ponds. Visible sheen of oil/gas in the water of settling ponds.

Mitigation

The principal concerns from stormwater runoff impacts to Tenderfoot Creek are sedimentation and petroleum hydrocarbons such as oil and gas. Currently there is no evidence that stormwater runoff from the Brite-X mine is reaching Tenderfoot Creek and the greatest impacts to Tenderfoot Creek appear to come from the cattle currently grazing in the area (See Soil and Water, Wildlife, and Fisheries section in Chapter 3.0). Any potential stormwater runoff from the development of the processing plant and ancillary facilities can be mitigated through the development of a Stormwater Pollution Prevention Plan that will be submitted to the South Dakota DENR Surface Water Discharge Program.

Stormwater runoff can be mitigated with source control Best Management Practices (BMP). There are two types of source control BMP's: operational and structural. Operational source control BMP's are nonstructural practices such as good housekeeping practices, employee training, inspections of pollutant sources, or record keeping. Structural source control BMP's are physical structural, or mechanical devices or facilities intended to prevent pollutants from entering stormwater. Examples include enclosing or covering the pollutant source, physically segregating the pollutant source to prevent contact with uncontaminated stormwater, and any devices that direct contaminated stormwater runoff to appropriate treatment BMP's. Treatment BMP's are used to treat specific pollution sources such as hydrocarbon contaminants from parking lots and fuel facilities.

To mitigate this relevant issue the Forest Service will require that Pacer Corporation implement the following components:

- BMP's used during construction activities to include but not limited to:
 - Avoid disturbing locations with known populations of sensitive plant species; removing riparian or wetland vegetation; filling or dredging the riparian area or wetland; diverting stream flow from the current channel.
 - Avoid using heavy equipment in moist areas where sensitive plants, reptiles, and amphibians may be present.
 - Install silt fences above wet areas to prevent storm runoff from washing silt into the stream or wetland before beginning construction.
 - All disturbed areas will be revegetated upon the completion of construction activities. Reseed and/or replant cut and fill slopes with a Forest Service approved seed mix to control erosion and for prevention of noxious weed infestations. Use a mulch to keep loose soil from blowing, creating more particulate matter in the air. Use hydro mulch, jute mesh, or a type of erosion control blanket on disturbed areas that are steep and/or adjacent to the riparian area.

- New Operational source control BMP's to include but not limited to:
 - Inspection/Monitoring Program for all Storm Water Facilities.
 - Spill Prevention Control and Countermeasure Plan.
 - BMP's for crusher surge stockpile, by-product stockpile from the processing facility, fuel management, and maintenance activities.
- New Structural source control BMP's to include but not limited to:
 - The fuel facility and fueling area will be covered and the entire area will be designed as a spill containment pad. All internal drainage within the fuel facility will be directed into a dead end sump that could be pumped in case of a fuel spill.
 - Additional sediment ponds will be constructed to handle stormwater runoff from the mine and associated facilities and equipment as needed.
 - The 0.3 miles of access road on Forest System land will be maintained to handle stormwater runoff. The road will be shaped and crowned using a Forest Service approved aggregate to form an in-slope that flows into the ditch. The ditch on the north side of the road will be cleaned and additional culverts placed to drain into settling ponds on the west side of the road.
- Treatment BMP's to include but not limited to:
 - All surface water runoff from the mill/warehouse and parking area will be directed into a spill control separator with oil absorbent bags.
- Update the existing structural source control BMP's:
 - The existing sediment pond at the bottom of the drainage must be expanded to 1.25 acre-feet capacity for a 500-year, 2-hour precipitation storm event before construction commences.
 - Benchmark elevations will be established in each settling pond. Sediment will be removed from the pond on an annual basis or when it comprises 20 percent of a ponds capacity. If a settling pond is holding it will be cleaned out in the fall.

Monitoring

The preferred alternative will be monitored to see if water and material are leaving the site and making it to Tenderfoot Creek. Sediment levels in the ponds will be monitored and the inspections will note if water has flowed over the spillways of the settling ponds. If the sediment levels meet established criteria and no water has flowed over spillways, then no further monitoring will need to be completed. If these conditions are not met, the District Hydrologist will need to be notified and this person will conduct further investigations of the settling ponds and Tenderfoot Creek. Monitoring will also include the written records of Inspection/Monitoring Program for all storm water facilities and maintenance activities completed by Pacer Corporation. If anyone notices disturbed raptors, several snakes together, or reptiles and amphibians crushed on road, a Forest Service Biologist will be immediately notified.

Errant fly rock from blasting activities may compromise the safety of the employees who will work at the proposed processing plant (Safety)

Indicator

Visual evidence of errant fly rock located in the vicinity of the processing plant.

Mitigation

To mitigate this relevant issue the Forest Service will require that Pacer Corporation develop a Blasting Plan that meets all U. S. Department of Labor Mine Safety and Health Administration (MSHA) requirements.

Monitoring

Visual inspections will be completed in the vicinity of the processing plant. Blasting activities will be reviewed if there is any evidence of errant fly rock. Safety monitoring and enforcement is the responsibility of MSHA.

Cattle may be killed by trucks using the access road to reach the proposed processing plant (Range Resource)

Indicator

Any reported incident between vehicles and cattle.

Mitigation

To mitigate this tracking issue the Forest Service will require that all vehicles operating on the Forest Service portion of the access road not to exceed a speed limit 15 mph.

Monitoring

Monitoring will include annual communication with the grazing permittee and Pacer Corporation. If the access road becomes a problem (vehicles hitting cattle on the road), fencing will be considered at that time.

Dust from the operation of the processing plant may impact the Forest and nearby residents (Air)

The indicator, mitigation, and monitoring of this tracking issue will be decided in the Air Quality permit issued by the State of South Dakota Department of Environment and Natural Resources Air Quality Division (See Chapter 3.0 for further discussion). All requirements of the Clean Air Act must be met before the issuance of the Air Quality permit. The approval and issuance of the air quality permit ensures the mitigation of this tracking issue.

The intersection of Highway 16/385 and the mine access road is dangerous due to limited sight distances from southbound traffic (Transportation)

Indicator

Sight line distance must be at least 600 feet.

Mitigation

The mitigation of this tracking issue is the responsibility of the State of South Dakota Department of Transportation. They plan to mitigate this issue by improving the sight line along Highway 16/385 to be at least 600 feet visibility and post "Truck Entering" signs to the north and south of the highway (D. Krause, Personal Communication, October 28, 2002).

Monitoring

Monitoring is the responsibility of the State of South Dakota Department of Transportation.

Other Mitigations or Requirements

1. Stationary lights around the proposed facility will only be used during operational hours. They will be turned off at all other times.
2. Insulate the facilities, as well as possible, to lessen the amount of noise produced by the processing plant.
3. Earth or vegetation color tones, found in the landscape, will be used for exterior colors of buildings and other structures. This would include the overhead conveyor, unless MSHA requires a different color for safety reasons.
4. Maintain, as much as possible, the existing vegetation between mine, conveyor, processing facility, and access road to screen structures and activities.
5. Minimize development along the access road into the site (by the settling pond). This will reduce visual impacts of the mining activities from the access road that provides access to adjacent private land.
6. Earthwork slopes should match existing slopes on the site using no more than a 4:1 or 3:1 maximum slope. Where slopes need to be steeper, use vertical retaining walls that are gray in color and are constructed of fractured-faced or angular-faced cement blocks, or native rock.
7. To meet scenic integrity objectives along the Highway 16/385 the proposed power line should tie into main power line at right angles to this travel corridor.
8. To reduce the visual effects of the overhead power line all attempts will be made to screen this initial connection from people traveling along Highway 16/385.
9. Signage will be placed around the perimeter of the Brite-X mine site warning people that they are entering an active mining area.
10. The public will not be allowed to use the road through the private land of the Case Estate to access Forest System lands.

2.3 COMPARISON OF ALTERNATIVES

The Forest Service's preferred alternative (Alternative 3) was developed in response to the issues and concerns identified for Alternatives 2, 4, and 5. The preferred alternative will minimize potentially adverse environmental impacts and will also meet all Forest Service rules and procedures for managing the surface effects of mining activities. It will not endanger or materially interfere with Pacer's legal rights guaranteed by the General Mining Law of 1872.

This section provides a summary comparison of the issues and features for each alternative. Information in Table 1 is focused on points of comparison to allow the public a better understanding of how the Interdisciplinary Team selected the preferred alternative and eliminated other alternatives from further analysis.

Point of Comparison	Alternatives Evaluated in EA		Alternatives Eliminated From Further Study		
	Alternative 1 <i>No Action</i>	Alternative 3 <i>Preferred Action</i>	Alternative 2 <i>Original Action</i>	Alternative 4	Alternative 5
Total Acreage Disturbed	0.0 acres	1.5 acres	2.5 acres	2.5 acres	2.5 acres
Distance to Tenderfoot Creek (Not including access road)	Not applicable.	800- 900 feet	400 – 500 feet	100 feet or less	100 feet or less
Length of Access Road on Federal Land	0.3 miles, the distance to the existing open pit.	0.3 miles, the distance to the existing open pit and the proposed processing plant.	0.3 miles, the proposed processing plant is closer but the distance to the existing open pit does not change.	Same as Alternative 2.	0.4 miles (approximate). Additional road would have to be constructed across FS land to access the Case Estate.
Clearing and Grubbing	None.	Cutting of up to 150 trees.	Cutting of up to 300 trees.	No cutting of trees.	Unknown.
Earthwork	None.	Minimum volume of earth and rock removed.	Large volumes of earth and rock removed.	Same as Alternative 2.	Same as Alternative 2.
Development	None.	The facility will be built using conventional construction techniques.	Same as Alternative 3.	Same as Alternative 3.	Same as Alternative 3.
Operation of Facility	Existing facility will continue to operate in Custer, SD and meet all stipulations in State of South Dakota permits.	Facility will operate to meet all stipulations in FS Plan of Operations and State of South Dakota permits.	Same as Alternative 3.	Same as Alternative 3.	Facility will operate to meet all stipulations in State of South Dakota permits.
Power Line	No power line will be built under this alternative.	The development of a power line may create a brief visual impact to people using Highway 16/385.	Same as Alternative 3.	Same as Alternative 3.	Unknown.

Point of Comparison	Alternatives Evaluated in EA		Alternatives Eliminated From Further Study		
	Alternative 1 <i>No Action</i>	Alternative 3 <i>Preferred Action</i>	Alternative 2 <i>Original Action</i>	Alternative 4	Alternative 5
Access Road Traffic	Traffic along the access road will continue at no more than 30 trips per week.	Traffic along the access road could reach up to 130 trips per week.	Same as Alternative 3.	Same as Alternative 3.	Same as Alternative 3.
Reclamation	None.	100 % of site can be reclaimed.	Approximately 75 % of site can be reclaimed.	Same as Alternative 3.	Same as Alternative 3.
Riparian Ecosystems	Riparian habitat in Tenderfoot Creek will not be impacted by the current mining activities.	Riparian habitat in Tenderfoot Creek will not be impacted by the mining activities. Riparian habitat will increase with the development of settling ponds.	Riparian habitat in Tenderfoot Creek will not be impacted by the mining activities. Riparian habitat may actually decrease with the elimination of large settling pond.	Same as alternative 3.	Unknown.
Snags & Woody Plant Material	The mine will continue to expand over time and may claim some snags and logs.	The mine will continue to expand and have similar impacts as in Alternative 1. The processing facility will have minimal impact on snags and logs.	Same as alternative 3.	The mine will continue to expand and have similar impacts as in Alternative 1. The development of processing facility will have no impact on snags and logs.	The mine will continue to expand and be impacted as in Alternative 1. It is unknown if the processing facility will impact snags and logs.
Wildlife Habitat	Expansion of the mine will decrease available wildlife habitat. No mineral processing facility will be built, so there are no associated impacts due to increased noise and activity levels at the mine site.	Expansion of the mine and building the processing facility will decrease available wildlife habitat. Greater activity and noise levels will increase potential impacts to wildlife.	Same as alternative 3.	Same as alternative 3.	Unknown.
Tenderfoot Creek Fisheries	No impacts would occur with a continuation of the current mining activities.	No impacts would occur by expanding the mining activities. Existing and new stormwater retention facilities in combination with BMP's will mitigate any potential impacts.	The elimination of the existing settling pond may increase the potential impacts to the fisheries. No impacts would occur by expanding the mining activities.	Same as alternative 3.	Unknown.
Recreation - Hunting	No impacts to existing hunting opportunities.	Only limited effects to hunting opportunities during the construction of the facility. No substantial long-term effects after facility is in operation.	Same as alternative 3.	Same as alternative 3.	Same as alternative 3.

	Alternatives Evaluated in EA		Alternatives Eliminated From Further Study		
Point of Comparison	Alternative 1 <i>No Action</i>	Alternative 3 <i>Preferred Action</i>	Alternative 2 <i>Original Action</i>	Alternative 4	Alternative 5
Scenic Resources	The mine is not readily visible from the surrounding properties. The scenic integrity of the site would not change with the continuation of mining activities.	The development of the processing facility and the continued operation and expansion of the mine will not effect the scenic integrity of the site.	The processing facility will be readily visible from Tenderfoot Creek and would effect the scenic integrity of the site.	Same as alternative 2.	While developed on private land, this alternative would still effect the scenic integrity of the surrounding FS land.
Relevant Issue - Storm Water The potential stormwater impacts may impact Tenderfoot Creek habitat and aquatic biota.	Existing stormwater retention facilities will mitigate any potential impacts.	Existing and new stormwater retention facilities in combination with BMP's will mitigate any potential impacts.	Existing stormwater retention facility will be removed. It is not possible to develop a new stormwater pond below the proposed facilities. While new BMP's would be developed, it is unknown if they would be adequate to mitigate all potential impacts.	New stormwater retention facilities would need to be developed. Their close proximity to Tenderfoot Creek may eliminate any potential benefits. While new BMP's would be developed, it is unknown if they would be adequate to mitigate all potential impacts.	Same as Alternative 4.
Relevant Issue - Safety Errant fly rock from blasting activities may compromise the safety of the employees who will work at the processing plant.	Not applicable since the facility is not located near the blasting activities.	All safety concerns can be addressed by moving people out of the area during blasting.	Same as alternative 3.	The distance from the open pit may be adequate to address all safety concerns.	Same as Alternative 4.
Relevant Issue - Cultural Resources Proposed activities may compromise the historic integrity of cultural resources.	It has been determined that no historic properties will be affected by this undertaking.	Same as Alternative 1.	Same as Alternative 1.	Unknown.	Unknown.
Tracking Issue - Air Dust from the operation of the processing plant may impact the Forest and nearby residents.	The existing facility will remain in operation under the existing State South Dakota Air Permits.	Dust from the facility will be mitigated as stipulated in the new SD Air Permit.	Same as Alternative 3.	Same as Alternative 3.	Same as Alternative 3.
Tracking Issue - Transportation The intersection of Highway 16/385 and the mine access road is dangerous due to limited site distances and slow moving trucks entering the highway.	The mitigation in alternative 3 can be implemented in this alternative.	Mitigation will require increasing the sight line distance and the placement of truck entering signs.	Same as Alternative 3.	Same as Alternative 3.	Same as Alternative 3.
Tracking Issue - Range Resources There is a concern that cattle may be killed by trucks using the access road to reach the proposed processing plant.	There will be no changes from the existing conditions.	Traffic along the road will increase in volume. A 15 mph speed limit will be established.	Same as Alternative 3.	Same as Alternative 3.	Same as Alternative 3.

Table 1: Features and Issues By Alternative

3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the physical, biological components of the affected environment of the Brite-X processing plant and the potential consequences to that environment due to the implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

The discussions of resources and potential effects take advantage of existing information included in the Black Hills National Forest Plan and Final EIS, project specific resource reports and related information, and other sources as indicated. Where applicable, such information is briefly summarized and referenced to minimize duplication. Complete specialist reports, and other analysis information are in the project planning record.

The discussions are arranged by resource area (e.g. Air, Soils and Water, Wildlife) and within each resource area the affected environment is described and the environmental consequences are disclosed. The environmental consequences discussion will describe any direct, indirect, or cumulative effects from the proposed activities. Direct effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or spatially removed from the activity. Cumulative effects are the result of past, present, and foreseeable future activities.

3.1 AIR

The Air Quality effects analysis cannot be completed at this time. Pacer Corporation must submit documentation detailing how the mill will operate, the potential emissions and the applicable regulatory requirements in the form of a permit application to the State of South Dakota's Department of Environment and Natural Resources Air Quality Division. Pacer Corporation has indicated that the air quality permit application will be submitted in January 2003. At that time the State, EPA and the Forest Service will collaborate in determining both the appropriate level of air quality analysis and the control measures that are protective of the local environment. The Forest Service will include the ambient air quality analysis in the final EA. Before the completion of the final EA the public will also have opportunities to provide comment to the State of South Dakota during their permitting process to evaluate Pacer's application for an Air Quality Permit.

3.1.1 Affected Environment

The Black Hills of South Dakota is a group of mountains that rise above the surrounding plains to form an "Island on the Plains." Plant communities from the Rocky Mountains, northern coniferous forests, eastern hardwood forests, and the surrounding Great Plains are present. Currently the Ponderosa Pine is the dominant tree species in the Black Hills as the result of wild land fire suppression and extensive logging. The Black Hills National Forest is a developed forest with an extensive road system of over 5,204 miles of system roads and an estimated 3,430 miles of wheel-track roads open to all types of recreation opportunities. Nineteen percent of the land within the proclaimed National Forest Boundary is privately owned and there are entire communities within the Forest (USDA Forest Service, 1996, FEIS Black Hill National Forest Plan).

The climate is highly variable with cold winters, warm summers, moderate precipitation, low relative humidity, rapid evaporation, and abundant sunshine. Two separate climate zones have been identified in the Black Hills. The Northern Hills climatic zone is typically cooler, has heavy snowfalls, and a precipitation level of up to 26 inches a year in the Deadwood/Lead area. The Southern Hills climatic zone is warmer in both the winter and summer, has less snow and rain, more sunny weather, less wind, and the total precipitation is much lower at 18 inches a year in the Custer area (USDA Forest Service, 1996, FEIS Black Hill National Forest Plan).

The Final Environmental Impact Statement for the Black Hills National Forest Plan (1996) characterizes the overall air quality in the Black Hills as excellent and is considered better than state and federal standards for total suspended particulates and gaseous emissions. Rapid City is currently designated as a non-attainment area for PM-10 (fine particulate air pollution) and exceeds the standard that the EPA has set to protect human health. The rest of the Black Hills meets or exceeds EPA standards for levels of particulate matter, sulfur dioxide, carbon monoxide, ozone, nitrogen oxide, and lead.

The proposed location for the Brite-X Mica Processing Facility is within the Black Hills National Forest in Custer County, South Dakota. Pursuant to Section 107 of Clean Air Act (CAA), this area has been designated attainment for all National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency.

CAA Section 162 designates each air quality region pursuant to the following definition:

(a) Upon the enactment of this part, all -

International parks, National wilderness areas which exceed 5,000 acres in size, National memorial parks which exceed 5,000 acres in size, and National parks which exceed six thousand acres in size, and which are in existence on the date of enactment of the Clean Air Act Amendments of 1977 shall be class I areas and may not be re-designated. All areas which were re-designated as class I under regulations promulgated before such date of enactment shall be class I areas which may be re-designated as provided in this part. The extent of the areas designated as Class I under this section shall conform to any changes in the boundaries of such areas which have occurred subsequent to the date of the enactment of the Clean Air Act Amendments of 1977, or which may occur subsequent to the date of the enactment of the Clean Air Act Amendments of 1990.

(b) All areas in such State designated pursuant to section 107(d) as attainment or unclassifiable which are not established as class I under subsection (a) shall be class II area unless re-designated under section 164.

The two federally designated Class I air-quality areas in western South Dakota are Wind Cave National Park (17 miles to the south) and Badlands National Park (40 miles to the east). Each of these class I areas are within 50 km of the proposed location of the mill facility. The nearest Forest Service administered class I area is Rawah Wilderness Area in Colorado approximately 350 miles southwest of the proposed facility location. Class I air quality areas have visibility goals to prevent any existing impairment of visibility from human caused air pollution. Currently the largest impact to Class I area air quality is the smoke associated from wildfire or prescribed burning in and adjacent to the National Forest. This is a temporary occurrence and does not compromise the goals for Class I air-quality (USDA Forest Service, 1996, FEIS Black Hill National Forest Plan).

The other significant areas in and adjacent to the Black Hills that have not been designated Class I areas are the following: Mt. Rushmore National Memorial (10 miles direct distance); Jewel Cave National Park (12 miles direct distance); Devils Tower National Monument (73 miles direct distance); Custer State Park (4 miles direct distance); Bear Butte State Park (43 miles direct distance); Angostura State Park (40 miles direct distance); Black Elk Wilderness (4 miles direct distance), Norbeck Wildlife Preserve (4 miles direct distance); and the Peter Norbeck Scenic By-Way (11 miles direct distance). The Crazy Horse rock-carving site is located on private land two miles direct distance from the proposed mill facility. Although these areas are considered class II, it should be noted that the each area has important cultural and natural resource value.

The closest communities to the project site are Custer (est. pop. 1800; 6.5 miles direct distance), Hill City (est. pop. 800; 7 miles direct distance), and Keystone (est. pop. 500; 12 miles direct distance). Highway 16/385 provides access to Custer and Hill city and is approximately three quarters of a mile east of the Brite-X mine site. A small residential area is adjacent to this private land along Tenderfoot Creek and a total of 10 houses have been built in this area. A helicopter port is located in this residential area and a recreational guide company conducts helicopter tours of the Black Hills in the summer.

3.1.2 Regulatory Direction

Forest Plan

Goal 1 - Protect basic soil, air, water, and cave resources: Soil, water and air provide the framework for forest and downstream health. Their condition affects the economic health of local communities, and by extension, communities beyond the Forest boundaries. Congress has recognized the importance of these resources to long-term national well being by providing direction for the maintenance or enhancement of soil, air, water and cave quality. Laws containing this direction include: the Clean Water Act; the Clean Air Act; the National Forest Management Act; the Organic Act; and the Federal Cave Resources Protection Act of 1988.

Air Resources in Wilderness – 2323.61 (Forest Plan, Appendix A-3)

1. Protect air quality and related values, including visibility, on Wilderness land designated Class 1 by the Clean Air Act as amended in 1977.
2. Protect air quality in Wilderness areas not qualifying as Class 1 under the same objectives as those for other national Forest System lands.

Air Quality – 2580.2 (Forest Plan, Appendix A-7)

1. Protect air quality related values within Class 1 areas, as described in 42 U.S.C. 7475 (d)(2)(b) and (c) and section 2580.5.
2. Control and minimize air-pollutant impact from land management activities.
3. Cooperate with air regulatory authorities to prevent significant adverse effects of air pollutants and atmospheric deposition on forest and rangeland resources.

Federal Clean Air Act Requirements

The purpose of Title I of the Clean Air Act is to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population. The Prevention of Significant Deterioration (PSD) of Air Quality requirements located in Title I, Part C of the Clean Air Act, are one way this goal is achieved. All actions approved on Forest Service land must comply with, among other statutory requirements, the Clean Air Act Title I. In this case, the proposed source must be able to demonstrate compliance with the Title I and its implementing regulations. This includes an air quality management process that is fashioned to insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources, to assure that emissions from any source will not interfere with any portion of the applicable implementation plan to prevent significant deterioration of air quality, and to assure that any decision to permit increased air pollution in any area is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.

The current operation for Pacer Corporation is a similar mica mill located at 41 3rd Street in downtown Custer, SD. This facility is a major air pollution source as defined by the Clean Air Act. The Clean Air Act section 169 defines a major source as:

The term "major emitting facility" means any of the following stationary sources of air pollutants which emit, or have the potential to emit, one

hundred tons per year or more of any air pollutant from the following types of stationary sources:

Fossil fuel fired steam electric plants of more than two hundred and fifty million British thermal units per hour heat input, Coal cleaning plants (thermal dryers), Kraft pulp mills, Portland Cement plants, Primary zinc smelters, Iron and steel mill plants, Primary aluminum ore reduction plants, Primary copper smelters, Municipal incinerators capable of charging more than fifty tons of refuse per day, Hydrofluoric, sulfuric, and nitric acid plants, Petroleum refineries, Lime plants, Phosphate rock processing plants, Coke oven batteries, Sulfur recovery plants, Carbon black plants (furnace process), Primary lead smelters, Fuel conversion plants, Sintering plants, secondary metal production facilities, Chemical process plants, Fossil-fuel boilers of more than two hundred and fifty million British thermal units per hour heat input, Petroleum storage and transfer facilities with a capacity exceeding three hundred thousand barrels, Taconite ore processing facilities, Glass fiber processing plants, and Charcoal production facilities.

Such term also includes any other source with the potential to emit two hundred and fifty tons per year or more of any air pollutant.

Because the potential emissions from this new source are expected to exceed the major source threshold, it will be subject to the Clean Air Act PSD regulations. New major sources of air pollution, or modification to existing major sources, are required to obtain a federal permit prior to commencing construction. The PSD requirements are pollutant specific. For example, if the facility emits many pollutants but only one is above the major sources threshold, the facility will only be subject to the PSD regulations for that specific pollutant.

3.1.3 Regulatory Procedures to Evaluate Environmental Effects

The existing facility located in Custer is operating under a synthetic minor permit issued by the State of South Dakota's Department of Environment and Natural Resources. The synthetic minor permitting process allows major sources that maintain their actual emission below the major source threshold to avoid federal requirements (i.e., BACT, modeling, increment analysis). However, to legally avoid these federal program requirements, the source operator, in this case Pacer Corporation must accept federally enforceable permit conditions to limit actual emission to levels below the applicable major source threshold. Federal enforceability ensures that emission limitations placed on a source are enforceable by EPA and citizens as both a legal and practical matter. This gives the public credible assurance that major source are not circumventing the Clean Air Act.

The State will need to issue a new operating permit if the mill moves to Forest Service land. The Pacer Corporation is currently providing the State with information regarding the size of the proposed mill, engineering descriptions of the proposed operating processes, proposed control technology, operating hours, and other information as needed. It is this information that will determine what requirements and/or permit conditions will be necessary to comply with applicable air pollution control statutes.

Additionally, this information will also allow the Forest Service to determine if the proposed source will contribute to degradation of air quality and/or air quality related values.

Because the Pacer Corporation has not submitted an application to the State of South Dakota's Department of Environment and Natural Resources at the time of printing the draft EA, it is unclear if the proposed facility will be subject to federal air pollution control regulations. Pacer Corporation has indicated that its current potential to emit is approximately 460 tons per year of particulate matter. The new facility's potential to emit could be approximately 870 tons per year of particulate matter, well above the major source threshold. The potential to emit for other regulated pollutants has not been determined, but particulate matter is likely the only pollutant subject to air pollution control regulations.

For the purposes of determining the impact on ambient air quality from this Forest Service decision, it should be evaluated pursuant to applicable health and welfare based air pollution control regulations. Based on the preliminary information submitted by the Pacer Corporation, the proposed facility's potential emissions of particulate matter would trigger PSD. However, if the State of South Dakota's Department of Environment and Natural Resources issues a synthetic minor permit with federally enforceable terms and/or conditions, the new source could avoid the PSD process. No determination can be made, however, on the applicability of a federally enforceable synthetic minor permit until Pacer Corporation submits a complete application outlining the production levels, operating hours, potential emissions and related information. Should the State of South Dakota's Department of Environment and Natural Resources determine a federally enforceable synthetic minor permit is not appropriate, a PSD permit will have to be issued. If the PSD regulatory process is triggered, a detailed analysis of the potential impact from this source on air quality and air quality related values would have to be performed.

Pacer Corporation must submit documentation detailing how the mill will operate, the potential emissions and the applicable regulatory requirements. Without this information, it is impossible for the Forest Service or the regulatory agencies to determine the potential effects on human health, federal lands, or the surrounding area. It is incumbent upon the Pacer Corporation to submit a complete air pollution control application in a timely manner to the State of South Dakota so an accurate determination can be made on the potential impact from this decision. The State, EPA and the Forest Service will collaborate in determining both the appropriate level of air quality analysis and the control measures that are protective of the local environment. The ambient air quality analysis will be included for public comment in a final EA. The public also has opportunities to provide comment during the State's permitting process for the new facility. The State of South Dakota's Air Quality Division can be contacted at:

South Dakota DENR Air Quality Division
523 E. Capitol, J Foss Building
Pierre, SD 57501-3181
605-775-5935

3.2 SOILS AND WATER

Watersheds are comprised of different components and each component applies its signature to the watershed, making each watershed unique. These components consist of: watershed boundaries, precipitation and climate, geology, soils, slope, watershed condition, streams, floodplains, wetlands, beneficial uses, water quality and quantity, private land, connected disturbed areas, and roads. This report discusses each component as it relates to the Brite-X mine processing plant and the effects of the proposal.

The cumulative impact area for this analysis is defined as all Forest System land within the Tenderfoot Creek watershed. The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility.

3.2.1 Affected Environment

Watershed

The proposed processing facility is located in a small 40-acre watershed (hereafter identified as the Brite-X watershed). This watershed is located within the boundaries of a Hydrologic Unit Code (HUC) watershed with a HUC 9 classification (See below table).

HUC Watershed	HUC Number	Name	Acres	Size Range (acres) for HUC Watersheds
HUC 9	101201090601040303		688	500-1,000
HUC 8	1012010906010403	Tenderfoot Creek	3,912	1,000-5,000
HUC 7	10120109060104		8,500	5,000-10,000
HUC 6	101201090601	Upper Spring Creek	43,067	10,000-50,000

(Watershed GIS Layer, 2002)

Precipitation and Climate

The proposed processing facility will be located at an elevation of 5,760 feet. This area has a semi-arid climate with low humidity throughout the year. Temperatures range from near 100° F during the summer months to well below 0° F in winter. Average annual precipitation estimates from an Isohyetal map for the area are 19 to 20 inches (Driscoll, Carter, Williamson and Putnam, 2002). The largest precipitation amounts typically occur during May and June while the smallest amounts typically occur during November through February (Driscoll, Carter, Williamson and Putnam, 2002). Approximately 50% of the annual precipitation occurs from May through July and approximately 70% of the annual precipitation occurs from April through August. Localized intense thunder cells associated with the monsoons can produce much greater rain than surrounding areas within one storm event. The Black Hills is prone to flash flooding because of steep stream gradients and intense thunderstorms. An extreme flood in 1972 on Rapid Creek and in adjacent drainages caused 237 deaths (USDI Geological Survey, 2001). The table below displays the expected precipitation for different storm frequencies and storm durations for the Rapid City area.

Storm Duration Minutes	10 Year Frequency inches	50 Year Frequency inches	100 Year Frequency inches	500 Year Frequency inches
15	1.04	1.40	1.57	1.96
30	1.45	2.03	2.25	3.05
60	1.86	2.64	2.95	3.82
120	1.96	2.68	3.06	4.04

(HDR Engineering, Inc, 2000)

The closest weather stations to the Brite-X mine site are in Custer and Hill City. The table below displays the 30-year precipitation average from 1961 to 1990 for these weather stations.

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Annual
Custer	0.36	0.56	0.95	1.88	3.08	3.23	3.26	2.04	1.54	0.95	0.58	0.56	18.99
Hill City	0.28	0.54	0.92	2.13	3.30	3.73	3.49	2.05	1.51	0.95	0.58	0.47	19.95
Average	0.32	0.55	0.94	2.00	3.19	3.48	3.38	2.04	1.52	0.95	0.58	0.52	19.47

(Driscoll, Hamade and Kenner, 2000)

Geology

The geology underlying the Brite-X mine and surrounding area consists of Precambrian metamorphic rock as illustrated in the table below. Undifferentiated Metamorphic and Igneous Rocks (Precambrian) consist of granites, schists, gneiss, pegmatites, slates and amphibolites of the central core of the Black Hills (Driscoll, Carter, Williamson and Putnam, 2002).

Description	% of Brite-X Watershed	% of HUC 8 Watershed
Undifferentiated Metamorphic and Igneous Rocks (Precambrian)	100%	100%

*Watershed is the HUC 8 watershed. (Forest Geology GIS Layer, 1995)

Soils

There are three different soil map units within the Brite-X watershed. They are BuE, CvB and RgG. Soils within the HUC 8 watershed total 12 different units. Two units, BuE and RgG, comprise 64% of the HUC 8 watershed and the rest of the soil types occupy 8% or less. Soil RgG has a very high erosion hazard rating and moderate mass wasting potential. This soil occupies 3% of the Brite-X watershed. There are no soils subject to compaction when wet included in the Brite-X watershed. Soils within the project area and watershed are listed in the table below.

Soil Type	Soil #	Soil Name	% of Brite-X Watershed	% of HUC 8 Watershed	Slope	Org. Mat.	H2O Table	E H R	Mass Move	Compaction	Rx Fire	Veg. Comp.	Seed Mort.	Wet Restrict
BtE	56E	Buska-Mocmont-Rock	0%	8%	10-40%	1-4%	>6'	M	L	N	L	M (h2o)	L-H (rock)	
BuE	55E	Buska-Rock	91%	48%	10-40%	2-4%	>6'	M	L	N	L	M (h2o)	L	
BvC	55C	Buska-Virkula	0%	5%	2-15%	2-4%	>6'	L	L	Y	L	M-H (h2o)	L	Y
CvB	40B	Cordeston	5%	6%	2-10%	4-6%	>6'	L	L	N	L	H (h2o)	L	
CwB	54B	Cordeston-Marshbrook	0%	2%	0-6%	4-15%	>6'	L	L	N	L	H (h2o)	M (h2o)	
HeE	43E	Heely	0%	3%	9-30%	2-5%	>6'	M	L	N	M (root)	M (h2o)	H (rock)	
HoD	50D	Hilger-Virkula	0%	1%	2-30%	2-6%	>6'	M	L	Y	L	M-H (h2o)	L-H (rock)	Y
MsC	56C	Mocmont	0%	1%	2-12%	1-3%	>6'	L	L	N	L	M (h2o)	H (rock)	
PaE	42E	Pactola-Virkula-Rock	0%	1%	10-40%	2-5%	>6'	M	M (parallel)	Y	L	M-H (h2o)	L-H (rock)	Y
RgG	55F	Rock-Buska	3%	16%	40-80%	2-4%	>6'	VH	M (parallel)	N	M (slope)	M (h2o)	L	Y
RkG	56F	Rock-Mocmont	0%	8%	40-80%	1-3%	>6'	VH	M (old)	N	M (slope)	M (h2o)	H (rock)	Y
RIG	41G	Rock-Pactola	0%	1%	40-80%	2-5%	>6'	VH	H (old, parallel)	N	M (slope)	M (h2o)	H (rock)	Y

Watershed Area is HUC 8 watershed, Org. Mat.=Topsoil Organic Matter, EHR=Erosion Hazard Rating, Compaction=Soils are subject to compaction when wet, Veg. Comp.=Vegetation Competition, Seed Mort.=Seedling Mortality, L=Low, M=Moderate, H=High, VH=Very High, Y=Yes. Sites with <2% organic matter may need to have fine slash retained on site. Landslide: (parallel)=unstable due to rocks parallel to slope, (old)=old landslides may be active, (wet)=wet seepy areas may slide. Sites with high vegetative competition are associated with high available water capacity (h2o). Wet restrictions: restrict machine operations to dry or frozen conditions to prevent erosion, mass movement, or compaction. (Soil Survey Polygons GIS Layer, 2000) (USDA Soil Conservation Service, 1990)

Slope

Eighty-two percent (82%) of the Brite-X watershed has slopes of 30% or less and 99% of the Brite-X watershed has slopes of 40% or less. Below is a table indicating the percentage of the Brite-X watershed in each slope class.

Slope Class	% of Brite-X Watershed	% Steeper in Brite-X Watershed	% of HUC 8 Watershed	% Steeper of HUC 8 Watershed
0-10%	6%	100%	10%	100%
10-20%	33%	94%	28%	90%
20-30%	43%	61%	31%	62%
30-40%	17%	18%	21%	31%
40-50%	1%	1%	7%	10%
50-60%	0%	0%	2%	3%
>60%	0%	0%	1%	1%

*Watershed is the HUC 8 watershed. (Classified Soil Groups GIS Layer, 2000)

Watershed Condition

Watershed Condition Assessments were completed for each sixth level watershed in the process of developing the Forest Plan. These assessments were based on the watershed sensitivity, known impacts, and available monitoring data. Since the Forest Plan has been completed a new watershed layer was completed and the Watershed Condition Assessments that were done do not match up with the new watershed layer. As part of

this existing conditions report, new Natural Watershed Sensitivity Index and Impact Indexes will be recalculated on the 8th level watershed.

The Natural Watershed Sensitivity Index is used to assess watershed sensitivity to see how sensitive the watersheds are and how they compare to each other. Sensitive areas in each watershed were identified on three criteria: (1) riparian areas/streamside management zones, (2) severely erodible soils, and (3) slopes greater than 60 percent. The sum of all areas (in acres) meeting any of these criteria divided by the total watershed acreage produces the Natural Watershed Sensitivity Index. Three qualitative categories were established for the index values:

- Low Sensitivity 0-29%
- Moderate Sensitivity 30-65%
- High Sensitivity 66-100%

Impact Index accounts for those impacts that are most likely to affect stream health. Connected Disturbed Areas are those disturbed sites that drain directly into streams and disturbed areas in close proximity to streams are most likely to be hydrologically connected. These disturbed sites allow sediment and associated pollutants to reach streams causing decreased physical habitat, decreased water quality, and increased risk of flood damage. Impact Index values are determined by dividing the number of acres of disturbed land adjacent to streams by the total stream buffer area in a watershed. Impact Index values less than 11 percent are considered minor. Below is a table indicating the Sensitivity and Impact Index for the HUC 8 watershed.

HUC 8 Number	Name	Sensitivity Index %	Impact Index %
1012010906010403	Tenderfoot Creek	28%	4%

Sensitivity Index – The index for Tenderfoot Creek is in the Low range but is near the upper limits. Impact Index – The index for Tenderfoot Creek is quite a bit lower than the limit of what is considered minor.

Streams

There are no mapped streams within the Brite-X watershed. The drainages are generally ephemeral due to the small size of the watershed. Within the Tenderfoot Creek drainage, there is an estimated nine miles of streams. The streams within this watershed have not been field checked as whether they are perennial, intermittent or ephemeral. Tenderfoot Creek is a perennial stream that flows to Spring Creek.

HUC 8 Number	Name	Stream Miles	
		Brite-X Watershed	HUC 8 Watershed
1012010906010403	Tenderfoot Creek	0.00	9.01

(Stream GIS Layer, 2002)

Floodplains

A floodplain is any area susceptible to being covered by floodwaters. There are no mapped 100-year floodplains within the Brite-X watershed. The 100-year flood is a flood having a one percent chance of being equaled or exceeded in magnitude in any given year. It is not a flood occurring once every 100 years. The 100-year floodplain acres for the watershed are listed in the table below.

HUC 8 Number	Name	Floodplain Acres	
		Brite-X Watershed	HUC 8 Watershed
1012010906010403	Tenderfoot Creek	0	74

(FEMA Flood Plain Coverage GIS Layer, 1996)

Wetlands

There are no mapped wetlands within the Brite-X watershed. Below the current mine, Pacer has built a settling pond to catch runoff and material from the mine and disturbed areas. Currently this pond has vegetation in it that has definite wetland characteristics. This pond is not a wetland because this area is a settling pond and the State of South Dakota requires Pacer to clean it out periodically, thus removing the vegetation and wetland characteristics. The wetland acres for the watershed are listed in the table below. These wetlands are located on private land.

HUC 8 Number	Name	Wetland Acres	
		Brite-X Watershed	HUC 8 Watershed
1012010906010403	Tenderfoot Creek	0.00	1.20

(USDI Fish and Wildlife Service, 2000)

Beneficial Uses

The South Dakota Department of Environment and Natural Resources assigns water quality standards based on the beneficial uses of each water body. Below the Brite-X mine, Tenderfoot Creek has the following designated beneficial uses.

Water Body	Beneficial Uses	
	Coldwater Permanent Fish Life Propagation	Limited Contact Recreation
Tenderfoot Creek	X	X

(Article 74:51, 1999)

Water Quality and Quantity

No streams or waterbodies within the project area are listed in the South Dakota 303(d) Waterbody List. This is a list of waterbodies do not meet water quality standards and need the development of Total Maximum Daily Loads (TMDLs). Total Maximum Daily Loads are a tool for the management of water quality.

The following statements were taken from the report, *South Dakota Water Quality, Water Years 1995 – 1999* (SD Department of Environment and Natural Resources, 2000).

“The Black Hills region traditionally has some of the best surface water quality in the state. This is due in large to a cooler climate during the growing season, and higher rainfall than the surrounding plains as a result of greater elevation and forest cover. Also contributing importantly to better water quality in this region is the nature of local bedrock formations which are much less erodible than the highly erosive and leachable marine shales and badlands on the surrounding plains.”

“Black Hill streams...usually have good to satisfactory water quality and fulfill their fishable/swimmable designated uses. They are, however, relatively small

streams vulnerable to losses of flow exacerbated by periodic droughts in the Black Hills and the increase in size and density of the ponderosa pine forest canopy; the latter being the natural result of forest fire suppression in the long term. Recent studies suggest a management regime that would maintain an intermediate level (e.g. 40-60% canopy cover) rather than a dense or open ponderosa pine canopy would benefit soil moisture, ground water, and therefore, improve stream flow during drier years. Establishing this level of forest cover would represent a good compromise between maintaining a forest ecosystem and increasing the water production potential of the Black Hills.”

There are no known site-specific data for Tenderfoot Creek and it is assumed that the stream is fulfilling its designated uses.

Private Land

Land ownership patterns are part of the watershed and could potential affect conditions. The entire Brite-X watershed in which Pacer is planning its mill is in the Forest. Within the HUC 8 watershed, there is 1,097 acres of private land. The table below shows the distribution of National Forest and private land.

HUC 8 Number	Name	National Forest Acres	% of HUC 8 Watershed National Forest	Private Land Acres	% of HUC 8 Watershed Private Land
1012010906010403	Tenderfoot Creek	2,815	72%	1,097	28%

(Forest Ownership GIS Layer, 2002)

Connected Disturbed Area

A Connected Disturbed Area is an area that is identified as contributing sediment to streams or wetlands causing degradation of physical function, degraded water quality and increased peak flows that may alter physical channel processes. When a disturbed area flows into a waterbody without sufficient delay from vegetated filter strips or sediment detention structures, it is connected to the waterbody. A Connected Disturbed Area may include bare soil patterns, compacted soils, roads, severely burned areas or mine spoils.

The Brite-X watershed does not currently have any Connected Disturbed Areas. There are two settling ponds between the disturbed areas and Tenderfoot Creek that effectively catch sediment. The access road leaving Brite-X mine also has sufficient buffer between it and Tenderfoot Creek to filter any road generated sediment.

The HUC 8 watershed has not been surveyed for Connected Disturbed Areas, however the road to the site from Highway 16/385 is very close to Tenderfoot Creek in three or four locations. At one location a culvert on private land discharges directly into Tenderfoot Creek. While these locations are on private land they may be contributing some amounts of sediment to Tenderfoot Creek.

Roads

Roads are generally the number one cause of problems in a watershed or project area. They tend to concentrate water and put it where it is not designed to go. The table below displays the road miles within the HUC 8 watershed.

HUC 8 Number	Name	Total Miles	State Highway Miles	Forest Arterial Miles	Collector and Local Miles	Forest Unclassified Miles
1012010906010403	Tenderfoot Creek	26.09	3.17	0.87	5.54	16.51

(Transportation/Roads Master GIS Layer, 2002)

3.2.2 Environmental Effects

Two alternatives are being evaluated for the Environmental Assessment. They include alternatives for no action and the preferred action. The report, *NEPA Guidance for Watersheds* (1996), is being used as a template for this analysis.

Concerns due to the proposed project may affect aquatic ecosystems, soil productivity, geologic hazards and special areas. Aquatic ecosystems include physical conditions (sediment, bed/bank stability and flow regimes), chemical conditions (temperature/oxygen and water purity) and biological conditions (aquatic life and TES species). Soil productivity includes soil erosion, compaction, nutrient removal, soil heating and regeneration hazard. Geologic hazards include landslides, soil failure and earthquakes. Special areas include riparian ecosystems, wetlands and floodplains. The section below discusses these components.

Forest Plan Direction

There is specific direction in the Forest Plan pertaining to the soil and water resource.

- Goal #1 – Protect basic soil, air, water and cave resources.
 - Objective 103 – Maintain or improve long-term stream health.
 - Objective 104 – Maintain or enhance watershed condition to foster favorable soil relationships and water quality.

The Forest Plan lists Standards and Guidelines for the different resources. Standards and Guidelines are used to determine if individual projects are in compliance with the Forest Plan. The following Standards and Guidelines are applicable to the soil and water resource for this project:

- Standard 1106. Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.
- Standard 1109. Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.
- Guideline 1110. Initiate revegetation as soon as possible, not to exceed 6 months, after termination of ground-disturbing activities. (Treated as a Standard.)
- Standard 1113. Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes and wetlands.
- Guideline 1115. When ground disturbing or vegetation management occurs, use vegetative buffer strips or barriers to reduce sediment. (Treated as a Standard.)
- Standard 1211. Place new sources of chemical and pathogenic pollutants where such pollutants will not reach surface or ground water.
- Standard 1212. Apply runoff controls to disconnect new pollutant sources from surface and ground water.

Best Management Practices

BMPs are implemented to control or limit non-point source pollution. The general thought is that if BMPs are implemented, then the project will meet the requirement of the Clean Water Act and protect water quality. The question has been brought up, how do we know the BMPs are effective or work. There have been several reviews of BMPs for timber sales. The States of South Dakota and Wyoming conducted the most recent BMP reviews in 2001 (Lee, W.K. and Everett, A. 2001 and Lee W.K. 2001). The South Dakota reports states, "The team concluded that South Dakota's Silviculture BMPs are being properly installed and are effective." "On the average, the BMPs met or exceeded 82 and 84 percent of the total rated points for application and effectiveness, respectively. Instances of gross neglect were not identified at any of the audited sales." The Wyoming report states "On average, audited sales were found to meet or exceed the standard set forth in the BMP handbook on 91.4 percent of the total application points, and 93.3 percent of the total effectiveness points." These reports show that BMPs are effective.

The preferred alternative will have mitigation measures or BMPs implemented to protect the water quality of Tenderfoot Creek. The measures will include a settling pond capable of storing runoff for a 500-year 2-hour precipitation event. The culverts from the road ditch will also drain into small settling ponds. These measures will be effective because all the runoff will be captured from the mine and propose processing site and will not discharge into Tenderfoot Creek. The ponds below the culvert will catch the suspended material and any water flowing out of the ponds will follow a circuitous water path and will infiltrate before it makes its way to Tenderfoot Creek. All this will be effective in protecting the water quality of Tenderfoot Creek.

Aquatic Ecosystems

Physical

Sediment

Most sediment delivered to streams comes from a source zone along streams whose width depends on topography, soils, and ground cover. Connected Disturbed Areas like roads and other disturbed soil near streams can deliver sediment during runoff events. Sediment deposits in streambeds can also harm insect populations and fish habitat.

Sediment delivered to Tenderfoot Creek is not expected with either alternative. Other than the road, the disturbed areas for the mine and mill site, are at least 800 feet from Tenderfoot Creek. Pacer has two settling ponds to collect stormwater runoff from the mine before reaching Tenderfoot Creek. There is no sediment reaching Tenderfoot Creek as indicated by the lack of sediment in the lower pond. The access road on National Forest is within 40 feet of Tenderfoot Creek. There is an adequate buffer and no Connected Disturbed Areas have been identified. On private land there are three or four areas where the road is right next to the stream and there may be some sediment being introduced to the stream. The road has a good gravel surface, a flat grade and does not appear to concentrate water so the sediment introduction may be minimal. Since these areas are on private land, the Forest Service does not have any jurisdiction on this section of road, and if there are problems, they will need to be addressed by South Dakota Department of Natural Resources.

The current situation or the no action alternative currently has two settling ponds that are collecting all sediment from the disturbed areas and part of the road. The road on National Forest has adequate buffer to filter any sediment from the road. The proposed action will have larger settling ponds to handle the increase runoff from the additional areas disturbed and will retain all runoff for up to a 2-hour 500-year storm once the construction site has been re-vegetated. Additional culverts will be added to the road and any flow through the culverts will go through these settling ponds. Based on the current situation and looking at the new plans, no sediment will be delivered to Tenderfoot Creek with either alternative.

Bed and Bank Stability

Bed and bank stability can be damaged from trampling by animals or humans, vehicle impact, degraded bank vegetation, or excessive flow augmentations. Streams can be made wider and shallower, pools and overhanging banks can be destroyed, and much sediment can be added to streams. Both alternatives will not have an impact on the bed and bank stability of Tenderfoot Creek. Since there are no activities planned near Tenderfoot Creek the only potential impact to the bed and bank stability would be the potential flow augmentations that would result from the disturbed areas. Runoff from the disturbed areas has the potential to increase flows. For the current situation or the no action alternative, the settling ponds capture the runoff from the currently disturbed areas that drain towards Tenderfoot Creek. The proposed action will not allow runoff from the disturbed areas to reach Tenderfoot Creek because the settling pond will be designed to retain all water from a 2-hour 500-year storm.

Flow Regimes

Flow regimes can be altered by major changes in cover type or ground cover, dense road networks, or water projects. Water temperature and chemistry, sediment transport, aquatic habitats, and aquatic life cycles can be degraded. Neither alternative will cause changes to flow regimes. An additional 1.5 acres is not a major change within the Brite-X watershed and the settling ponds will be designed to retain all water from a 2-hour 500-year storm.

Chemical

Temperature/Oxygen

Summer water temperature is increased and winter water temperature is decreased by removing shade, reducing low flows, or damaging banks so streams are wider and shallower. Dissolved oxygen is usually reduced when summer water temperature is increased. Such impacts impair or destroy the suitability of water bodies for aquatic biota. Neither alternative will have an affect on the temperature/oxygen of Tenderfoot Creek. Shade, flows or banks on Tenderfoot Creek will not be affected or impacted because no activities are near the stream and all runoff from a 2-year 500-year storm is designed to be stored in the settling ponds.

Water Purity

Water purity can be degraded by placing concentrated pollutant sources near water bodies, applying harmful chemicals in or near water bodies, or intercepting hazardous rock strata by roads. Degrading water purity can impair or destroy use of the water body

by aquatic biota, and humans. Water purity will not be affected by either alternative. Any sediment will be retained in the settling ponds and paving the parking lot will reduce sediment input into the ponds. With the current design the fuel storage is located as possible from Tenderfoot Creek. The fuel storage area will also have a containment area designed to hold 110 percent of the largest tank.

Biological

Aquatic Life

Aquatic life can be degraded by migration barriers, changed flow regimes, riparian damage, or large sediment loads or chemical loads. Aquatic life will not be affected by either alternative. As discussed above, both alternatives will not change flow regimes or increase sediment or chemical loads. The current project or proposed project will not create migration barriers or damage the riparian areas because the mine and proposed processing facility are at least 800 feet from Tenderfoot Creek.

Threatened and Endangered Species (TES)

Species may decline from sensitive to threatened to endangered to extinct. Predation, competition, harvest, or habitat damage may cause listing or loss of species. There are no aquatic TES species in the preferred alternative, and consequently none will be affected by either alternative. The Biological Evaluation (BE) prepared for this project list several sensitive aquatic species and plants, as having suitable habitat in the project area according to the Forest Plan. The Biological Evaluation has a determination of “May adversely impact individuals but are not likely to result in a loss of species viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.” As discussed above, both alternatives will not impact Tenderfoot Creek. Any aquatic sensitive species or plants located in Tenderfoot Creek or downstream will not be affected.

Soil Productivity

Soil Erosion

Severe erosion can impair long term soil productivity if soils are heavily disturbed on shallow or highly erodible soils. Evidence of severe erosion is rills or pedestals. Within the Brite-X watershed, there is one acre of soils that has a severe erosion hazard rating. This is on the fringe of the Brite-X watershed and is not near the Brite-X mine. The processing facility will be built on ground that has slopes 10-20% as identified from the Classified Soils Groups GIS layer (USDA Forest Service, 2000). The topsoil will be stockpiled, areas used in construction that are not part of the mill or paved parking lot will be revegetated. Soil erosion is not anticipated to be a problem.

Soil Compaction

Soil compaction is caused by the excess weight of vehicles and animals. It impairs infiltration, root growth, and soil biota. The soils at the processing facility do not require restrictions when the soils are wet. The area will be in a disturbed state for approximately 50 years with the development of the processing facility and paved parking area. The topsoil is being stocked piled for use in reclamation of the site when the project is completed and any compaction problems will be corrected at that time. Soil compaction is not a concern with either alternative.

Nutrient Removal

Soil fertility depends on organic matter and nutrients. Soil productivity can be degraded if humus and topsoil, or even excess leaves and limbs, are taken off site. Nutrient removal is not a concern with either alternative. The area will be out of production as long as the processing facility is present. The topsoil is being stockpiled for reclamation of the site upon completion.

Geologic Hazards

Landslides

Soil creep, debris avalanches and flows, slumps, and earth flows can occur if roads overload or undercut unstable slopes; vegetation is removed from them; or runoff is emptied onto them. Hazard depends on the type of disturbance, nature of earth material, and the water content. There is one acre of soils that have a mass wasting potential that is located on the fringe of the watershed and is not near the proposed processing facility. Landslides are not a concern with either alternative.

Soil Failures

Soil failures include land subsidence, shrinking and swelling soils, and collapsing soils. Removal of subsurface fluids or materials, or changed hydrology on certain soil types, can induce soil failures. Soil failures are not a concern with either alternative.

Earthquakes

Earthquake hazards can be increased if facilities are located in seismically active areas. Areas of greatest potential are near the Colorado Front Range and in northwestern Wyoming. Earthquakes are not a concern in the Black Hills and not a concern with either alternative.

Special Areas

Riparian Ecosystems

Riparian ecosystems provide shade, bank stability, fish cover, and woody debris to aquatic ecosystems. They also provide key wildlife habitat, migration corridors, sediment storage and release, and surface-ground water interactions. Composition and structure of riparian vegetation can be changed by actions that remove certain species age classes. There are no riparian ecosystems on the Brite-X watershed so riparian ecosystems will not be impacted or affected by the project. Neither alternative will affect downstream riparian ecosystems.

Wetlands

Wetlands control runoff and water quality, recharge ground water, and provide special habitats. Actions that may alter their ground cover, soil structure, water budgets, drainage patterns, and long term plant composition can impair these values. There are no wetlands on the Brite-X watershed site so wetlands will not be impacted or affected by either alternative. There are also no mapped wetlands downstream of the project within the HUC 8 watershed.

Floodplains

Floodplains are natural escape areas for floods that temper flood stages and velocities. There are no floodplains on the Brite-X watershed so floodplains will not be impacted or affected by the project. Neither alternative will affect downstream floodplains.

3.2.3 Cumulative Effects

The preferred alternative is located in the Tenderfoot Creek HUC 8 watershed. Land uses within this watershed include mining, timber harvest, grazing, residential housing and dispersed recreation. All of these activities individually have an impact on the watershed. This results in a cumulative impact on the watershed. The table below identifies each activity that has occurred within the watershed.

Tenderfoot Creek Watershed – 1012010906010403 – 3,912 ac. – Cumulative Effects					
Past Actions					
Timber Harvest					
Time Period	Acres Of Commercial Activities	Acres Of Pre-Commercial Activities	Acres Of Pre-Com. Activities Outside Commercial Units	Total Acres Treated	% Of Watershed
1980-1984	676	1		676	17%
1985-1989	288	224		288	7%
1990-1994	0	76	13	13	0%
1995-1999	32	77		32	1%
2000-Present	138	116	34	172	4%
Total	1134	494	37	1171	30%
Fire					
Acres within Watershed					% Of Watershed
0					0%
Past, Present and Future Actions					
Grazing (100% of the watershed is within a grazing allotment)					
Allotment/Pasture	Pasture Acres	Acres of Pasture within Watershed	Percent of Pasture within Watershed		
Palmer Gulch – Lower Bear	1,775	99	6%		
Tenderfoot – Thunder Mountain	2,922	1,171	40%		
Tenderfoot - Paulsen	1,891	1,412	75%		
Tenderfoot - Case	676	664	98%		
Tenderfoot – Rifle Range	1,380	68	5%		
Ownership					
Acres Private Land	% Of Watershed				
1089	28%				
Roads					
Miles Of Road	Acres Of Road	% Of Watershed			
26.1	47	1%			
Pacer Mine					

Acres Disturbed ⁽¹⁾	% Of Watershed			
5.5	0.1%			
FS Preferred Action – Pacer Mill				
New Acres Disturbed ⁽¹⁾	% Of Watershed			
3.25	0.1%			
Foreseeable Future Action - Timber				
Time Period	Acres Com. Activities	Acres Pre Com. Activities	Total Acres	% Of Watershed
2003 & Beyond	?	?	?	?%

(1) The Pacer mine currently has disturbed five and half acres. Three and a half of that is the mine and that area drains into itself. The other two acres are a staging area and a waste dump. The proposed processing plant will impact another three and a quarter acres during construction. After the disturbed areas have been revegetated, only one and a half additional acres will be contributing.

Timber harvest has occurred in the past and will continue into the future. Future numbers are unknown at this point in time but could be similar to the numbers in the past. In general, timber does not contribute to the cumulative impact problem of a watershed. Best Management Practices (BMP) monitoring has shown that if BMPs are implemented there is very little or no impacts to the watershed. Timber harvests also reduces the number of trees within the watershed making more water available for stream flow or ground water recharge.

Fire has not contributed to the cumulative impact of the watershed. There have not been any large fires within the watershed in recent times.

Grazing has been occurring for a long time and will continue into the future. Watershed impacts come from grazing the riparian zone and trampling of the stream and banks. Upland grazing generally does not contribute to the impacts on the watershed. To reduce the cumulative impacts of grazing on the watershed, the cattle should be allowed only for a short period of time in the riparian area. Impacts occur where they continually graze the riparian areas.

Private land in the Tenderfoot watershed can contribute to the cumulative impacts. In many cases the private land is along streams. Impacts can be from residential, grazing or roads. It is difficult to assess the total impacts from private land without doing a detailed inventory.

Roads are generally the number one problem within a watershed. They tend to concentrate water and put it where it is not designed to go. When they do this near streams they can degrade the stream and water quality and potentially impact the beneficial uses that the waters are designated to provide. When it occurs on hillsides, soil productivity is affected and can have a cumulative impact on the watershed. In the Tenderfoot watershed, one percent (1%) of the watershed is in roads, which equates to more than four miles of road per square mile. US Highway 16/385 also goes through this watershed. It is a three lane highway and required large cuts and fills. This interrupts the natural flow processes and can tend to concentrate water even though the cuts and fills have been revegetated. Roads have definitely impacted this watershed. The alternatives discussed do not result in the construction of new roads. Existing roads will be used in all alternatives.

The Brite-X mine currently has disturbed five and half acres. Three and a half of that is

the mine and that area drains into itself. This is not contributing to the impacts on the watershed other than taking the site out of productivity. The other two acres are a staging area and a waste dump. This area has the potential to impact Tenderfoot Creek but settling ponds have been constructed to contain any sediment. This has been working and impacts to Tenderfoot Creek have not occurred. The proposed mill will impact another three and a quarter acres during construction and after the disturbed areas have been revegetated, only one and a half additional acres will be contributing. This whole site will not contribute to the cumulative watershed impacts, other than taking the site out of productivity, since BMPs are being implemented. These BMPs will eliminate the impacts to Tenderfoot Creek and the watershed. BMPs will be implemented on the road and processing facility and any runoff will enter settling ponds that can retain the runoff of a 500-year 2-hour event.

All of the above uses contribute to the cumulative impacts to the watershed with some more than others. There have definitely been impacts to the watershed. It is the professional opinion of the Forest Service Hydrologist that these combined uses in the watershed have not impacted the watershed to the point that the beneficial uses, that Tenderfoot Creek has been assigned, have been affected. As land managers, it is wise to take opportunities to fix problems, as opportunities arise, thus reducing the cumulative impacts on the watershed. Brite-X mine and processing facility will have BMPs and mitigation measures applied so there will be no impacts on National Forest from this operation that will contribute to the cumulative watershed impacts of the watershed, other than taking the disturbed areas out of productivity.

3.3 WILDLIFE

This section will discuss and analyze the effects of the alternatives on wildlife resources, especially those species emphasized in the Phase 1 amendment. The effects analysis will be based on criteria established in the revised standards and guidelines included in the Phase 1 amendment. For all species discussed here, the analysis area boundary is a ½ mile radius around the Brite-X mine and the proposed power line route. The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility. Cumulative effects of actions occurring outside of this boundary were analyzed in the Forest Plan and the Phase 1 amendment. This analysis is tiered to the 1997 Revised Land and Resource Management Plan (the Forest Plan) as amended by the Phase 1 Amendment (2001).

3.3.1 Field Surveys/Resource Contacts

A total of five different surveys were conducted at the mine site. A plant survey was conducted for Region 2 sensitive species on June 20, 2002. Marsh Muhly, a sensitive plant, and a Black Hills red-bellied snake, an R2 sensitive species, were found south of the mine site. The proposed power line corridor was surveyed for sensitive plants and animals on August 20, 2002 and no sensitive plants or animals were located. The area where the Black Hills red-bellied snake was located was re-examined on August 21, 2002. All rock outcrops and rock waste piles were searched and no snakes or hibernacula were located. A site visit to the proposed mica mill site on Tenderfoot Creek and the current mill site in Custer, SD occurred on October 22, 2002 as part of a multi-agency project review. On November 4, 2002 the conifer habitat surrounding the mine site was surveyed for northern goshawk habitat. The only potential habitat was less than 15 acres and was not found suitable for goshawk nesting habitat. No sensitive animals or plants were observed in the goshawk habitat examination. On November 27, 2002 snag and down woody material was measured using quarter acre plots in site 030501-022 which encircles the mine.

3.3.2 Affected Environment

The proposed building site for the new facilities is east of the mine pit and existing parking area. The plant and warehouse will disturb 1½ acres forestland. The south end of the processing facility is approximately 800-900 feet up hill from Tenderfoot Creek. This site is a gentle west-facing slope dominated by mature ponderosa pine with a few immature and young pines. The proposed power line will follow a west-east route from Highway 16/385 to the Brite-X mine.

The main structural stage surrounding the mine claim is in a 4B condition. Ponderosa pine trees dominate these stands. Size and age class vary from mature yellow barks to young seedlings with some poles. Young pine trees are not adequately stocked over most of these acres. The exception is the northwest corner of the mine claim where saplings are dense. The canopy cover in these pine sites ranges from 40-70 percent. There are old stumps from logging activity completed several decades ago.

There are some spruce sites, structural stage 4B, south of the Tenderfoot Creek drainage. Natural causes are encouraging mortality in these spruce sites on the north-facing slopes.

Logs and snags are providing ample wildlife habitat. There are young spruce trees emerging in the under-story and farther up the slope there is more ponderosa pine. The drainage itself, mostly on private land, is dominated by spruce. Tenderfoot Creek and the mine are in Tenderfoot grazing allotment. Cattle are causing detrimental impacts to the creek bank by creating hummocks and some vegetation loss.

Hardwoods are lacking within a ½ mile radius of the mine site and there is only an occasional aspen in the under-story of the pine stands. East of the mine site there are some aspen and birch trees in the next draw. Regeneration in these hardwoods is poor. Recent logging has occurred a half-mile to the east of the mine site in the Limestone Timber Sale.

3.3.3 Environmental Effects

Species or Habitat of Concern

Riparian Habitat

Forest Plan Direction

Guideline 1506 (treat as Standard). Minimize disturbance to the riparian area by mineral activities. Initiate timely and effective rehabilitation of disturbed areas and restore riparian areas to a state of productivity comparable to that before disturbance: a. Prohibit the depositing of material from drilling, processing or site preparation in natural drainages. b. Locate the lower edge of disturbed or deposited soil banks outside of natural drainages and riparian areas. c. Prohibit stockpiling of topsoil or any other disturbed soil in natural drainages or riparian areas. d. Prohibit mineral processing (milling) activities within natural drainages or riparian areas.

Guideline 1508 (treat as Standard). Require monitoring of mining mitigative measures in riparian areas to insure that the measures are effective and in compliance with applicable water-quality standards.

Existing Conditions

Tenderfoot Creek and several settling ponds are creating riparian habitat near the Brite-X Mine. Tenderfoot Creek flows east to Highway 16/385, is located ¼ mile south of the Brite-X Mine, and is a permanent cold-water fishery (Michals, S., Personal Communication, 2002). These riparian areas are not only important for fish, but also amphibians, reptiles, and other wildlife species requiring a drink source. Many of the Black Hills sensitive plant species are also found in riparian areas.

No Action Alternative 1

The largest settling pond north of Tenderfoot Creek has partially filled in with sediment because of a lack of maintenance. Wetland vegetation such as sedges and willows are present. This sediment pond will continue to hold water during times of high precipitation. No impacts are apparent from the current Brite-X mining operation to the riparian area in Tenderfoot Creek. (See Fishery Section)

Preferred Alternative 3

No impacts are expected in the Tenderfoot Creek area. Building a new processing facility at the Brite-X mine and reclaiming the existing processing facility in Custer, South Dakota will improve the French Creek Riparian area.

Snags and Down Woody Material

Forest Plan Direction

Standard 2301. Within the associated watershed, for each vegetation management project, retain the following minimum densities of hard snags (unless snags are a safety hazard) at least 25 feet in height: a. Ponderosa Pine on south- or west-facing slopes or in exposed areas which would have historically supported a more frequent, lower intensity fire regime: Retain an average of 2 snags per acre > 10" DBH, collectively 25% of which must be > 20" DBH. If 20" DBH or 25 feet high snags are not available, retain snags in the largest size class available.

Standard 2308. a. Prescriptions shall be developed prior to timber harvest to identify the amount, size(s), and distribution of down logs to be left on-site. On conifer-forested sites (ponderosa pine and white spruce) retain an average of at least 50 linear feet per acre of coarse woody debris with a minimum diameter of 10 inches (where materials are available). Design vegetative management activities, including prescribed fire, to maintain ten sound logs per acre (eight logs minimum length 10 feet, 10 inches diameter; two logs minimum length 10 feet, 20 inches diameter) to provide future den sites, resting sites, and prey habitat within areas currently occupied by martens or with height potential for occupancy.

Existing Conditions

Timber harvest activities did not have mitigation to protect snags prior to 1983. Since 1983 mitigation measures have been put in place to protect snags. The Limestone Timber Sale was required to leave snags/logs in place. Natural succession and mortality of trees has occurred on some acres around the mine site. The spruce stands have suffered blow down and mortality through time. Pine have suffered some storm damage in the last three years, however, most of the trees impacted are below 10" DBH.

Snag density around the mine are below Forest Service standards and down woody material exceeds the Forest Service standard. The snags survey in site 030501-0022 averaged 1.1 per acre which is below Forest Service Standard 2301. Snags smaller than what the standard calls were present but not counted. Down woody material far exceeded the fifty linear feet required by Forest Service Standard 2308. There is more than 250 feet of coarse material per acre average. Storm damage has broken tops of pine in this site and most of the trees affected were of pole size.

No Action Alternative 1

The current mining process at the Brite-X Mine does not affect snags. There is potential to create snags if large rocks are launched during blasting and strike trees but this is highly unlikely.

Preferred Alternative 3

There are no snags over 10" DBH that will be cut in the area that would be impacted with the construction of the proposed facilities. The existing condition of snags and down woody material would not be impacted under the preferred alternative.

*Cooper's Rocky Mountain Snail (Oreohelix strigosa cooperi) / Cockerell's Striate Disc (Discus shimeki)*Forest Plan Direction

Forest Standard 3103. Ensure that all identified colonies (as indicated in Frest 1993 and Frest 2002) of the following two regionally sensitive snail species: *Discus shimeki*; *Oreohelix strigosa cooperi*; and the following five snail species: *Vertigo arthuri*; *Vertigo paradoxa*; *Catinella gelida*; *Oreohelix strigosa* n. subsp.; *Oreohelix strigosa berryi*, are protected from adverse effects of livestock use and other management activities (USDA Forest Service, 2001, Phase 1 Amendment).

Existing Conditions

There is potential habitat for these snail species in the area. Preferred habitat is moist east and north-facing slopes of white spruce habitat. Ponderosa pine with a deciduous component is also suitable habitat for the snails. Down woody material is an important component as well (USDA Forest Service, 1996, FEIS Black Hill National Forest Plan). The spruce sites are within 1,000 feet of the proposed buildings. Sites were identified by Frest in 1993 and 2001. Frest did not locate any sites within a mile radius of the Brite-X Mine (Frest and Johannes, 2002).

Alternatives

Spruce sites, these snails preferred habitat, will not be affected in either alternative.

MIS Sensitive Species Habitat

The Forest Plan as amended by the Phase 1 amendment list management indicator species to be considered during project planning. The amended list includes Threatened and Endangered (T&E) Species, Sensitive Species, and Species of Special Interest. T&E Species are addressed later in this report. Terrestrial Species of Special Interest are listed and discussed in this section. Aquatic Species of special interest will be addressed in the Fisheries section.

*Elk (Cervus elaphus) / Mule Deer (Odocoileus hemionus) / White-tailed Deer (Odocoileus virginianus)*Forest Plan Direction

Guideline 3202. Structures such as fences and roads will be designed and built so that they do not create unnecessary or unreasonable barriers or hazards for wildlife and people.

Guideline 3203 (Treat as standard). Provide big game screening on 20 percent of arterial and collector roads.

Guideline 5.1-3201 (Treat as standard). Deer and elk habitat effectiveness values in a planning unit should at least meet the following values. Projects in planning units

currently below these values should result in increased habitat effectiveness, Elk summer = 43 percent, Deer winter = 35 percent.

Existing Conditions

Big game ungulates in this project area include elk, mule deer, and white-tailed deer. During field visits to the project area, deer sign was observed near the mine pit, Tenderfoot Creek, and in conifer sites adjacent to the mine.

According to researchers there are several ways that animals are affected by noise pollution. Hearing loss is one adverse effect of loud noise. Masking, the inability to hear important environmental cues and animal signals due to interfering noise, may occur. Physiological effects, such as increased heart rate and respiration and general stress reactions, may occur. Behavioral effects can be an adverse reaction to noise. These vary greatly by species and noise. Examples may be abandonment of territory and lost reproduction. Habituation would fall into this category as well. Habituation is when animals become accustomed to disturbance, such as deer becoming used to traffic. Often this has detrimental effects (Bowles, 1995).

Bowles writes there are three responses to human made noises: attraction, tolerance, and aversion. Studies indicate ungulates and carnivores changed movement in response to traffic and construction noise. Ungulates leave an area during times of noise and return when noise is over. If these animals are not harassed they will adapt. If animals are harassed plus hearing noise their response will amplify (Bowles, 1995).

No Action Alternative 1

The noise level in the Custer mica processing facility is 70-75 dba and under the no action alternative, this town facility will stay in operation. Under Alternative 1 the elk and deer will continue to use the area as they have adapted to the blasting and traffic noise that already exists at the Brite-X Mine. This is indicated by personal observations, game trails, and tracks. Mine employees have also observed large game in the pit itself looking for water (Kruse G., Personal Communication, 2002).

Preferred Alternative 3

This alternative will use nightlights placed outside of the processing plant. The use of nightlights may keep ungulates away from the area during the quiet night times. Traffic will increase and noise will be constant under this alternative. Deer and elk may habituate to the noise and/or nightlights.

Merriam's Turkey (Meleagris gallopavo merriami)

Forest Plan Direction

Guideline 3205 (Treat as Standard). Provide at least 2 to 6 turkey roost sites per section (mature trees w/ average diameter 10 – 14", widely spaced horizontal branches, basal area at least 90 sqft/ac). Sites should be at least ¼ acre in size and not isolated from adjacent forested stands. Emphasis should be on the upper third of east-facing slopes if available.

Existing Conditions

During the field visit of October 22, 2002 a flock of turkeys was seen south of the mine. On November 4, 2002 turkey droppings were found near Tenderfoot Creek. It appears turkeys often use the area and are not impacted by the current noise of the Brite-X Mine.

No Action Alternative 1

Under this alternative the turkey will continue to use the area as they have adapted to the blasting and traffic noise that already exists at the Brite-X Mine.

Preferred Action Alternative 3

Turkeys would continue to use the mine area for foraging and possibly roosting. Under this alternative the noise levels would increase to a constant 70-75 dba sound. Blasts would continue as in Alternative 1 but would occur more often.

It appears these turkeys have habituated to the mine noises. They should slowly adjust to the new mine facility. A very small number of trees will be cut. There is no evidence of turkeys in this parcel of pine trees and this area is not used as a roost by turkeys.

Mountain Lion (Felis concolor)

Forest Plan Direction

There is no specific management direction for the mountain lion.

Existing Conditions

The project area has suitable lion habitat along with a good prey base. Deer are the preferred prey but turkey and rodents are also taken for prey. It is estimated there are 40-50 lions in the Black Hills. The male lion's home range is generally smaller than 400 square miles and the females less than 150 square miles. (Fecske, 2001) Dispersing mountain lions miss crucial landscape linkages due to their avoidance of lit areas (The Urban Wildlands Group, 2002). Mountain lions have been observed within three miles of the Brite-X Mine in the last five years according to district observation records.

No Action Alternative 1

Under this alternative there are no night-lights in use at the Brite-X Mine. Lights are one aspect that would not cause an impact to lions currently in the area.

Preferred Alternative 3

This alternative will use nightlights at the new facility. Pacer would like to keep the lights on for the duration of the night. This could directly impact lions in the area. Some animals may use this area as a travel corridor. Long-term effects may lend to finding another route.

Threatened and Endangered Sensitive Species

A biological evaluation has been completed for this project. Federally threatened, endangered and proposed species, along with regional sensitive plant and animal species are considered in a biological evaluation. No threatened, endangered, or proposed species were observed. Two Region 2 sensitive plant/animal species were found during the visits. This was the Marsh Muhly, and Black Hills red-bellied snake.

The US Fish & Wildlife Service lists the bald eagle and the black-footed ferret as threatened or endangered species in Custer County. A No Effect determination applies to these federally listed species. Neither alternative will have an effect on these species.

There are potentially twenty-five Region 2 sensitive plant and animal species near the proposed site. The same determination, “May adversely impact individuals but are not likely to result in a loss of species viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide”, was made for all twenty-five species (refer to BE in project file).

Forest Plan direction common to each of these species is Forest Standard 3115. It states, “A sensitive species located after contract or permit formation will be appropriately managed by active coordination between permittee, contractor or purchaser, Forest Service line officer, project administrator, and biologist. Viable solutions need to be based on the circumstances surrounding each new discovery and must consider the individual sensitive species needing protection, contractual obligations and costs, and mitigation measures available at the time of discovery.”

Marsh Muhly (Muhlenbergia glomerata)

Forest Plan Direction

Standard 3107. Consider the use of one, or a combination of the following protection measures, to protect sensitive plants or their habitat during and after trail, road and highway construction activities: a) Avoid the following: disturbing locations with known populations of sensitive plant species; removing riparian or wetland vegetation; filling or dredging the riparian area or wetland; diverting stream flow from the current channel. b) Install silt fences above wet areas to prevent storm runoff from washing silt into the stream or wetland. c) Reseed and/or replant cut and fill slopes with native seed and/or native plants promptly, to control erosion and for prevention of noxious weed infestations. Use hydro mulch, jute mesh, or a type of erosion control blanket on disturbed areas that are steep and/or adjacent to the riparian area. d) If temporary stream diversions are necessary, determine the seasonal timing such that diversions would have the least potential to adversely affect sensitive plant populations.

Existing Conditions

Marsh Muhly was found on June 20, 2002. This plant usually occurs in open woodlands or drainages.

Alternatives

In either alternative this plant stands the chance of being impacted by machinery, vehicles, and rocks. In neither alternative will the actual site where the plants were found be impacted. Under Alternative 3 there is a potential for increased impacts to sensitive plants, including marsh muhly. Power line installation, construction of the new processing facility and cutting pine trees are a few processes that could impact plants.

Black Hills Red-Bellied Snake (Storeria occipitomaculata pahasapae)

Forest Plan Direction

Standard 3116. Avoid creating barriers (i.e. new open roads) between red-bellied snake hibernacula and wetlands (USDA Forest Service, 1996, 2001).

Existing Conditions

On June 20, 2002 a specimen was found northwest of the largest settling pond in the draw north of Tenderfoot Creek. No hibernacula were found, however possible locations are numerous. This snake is often found near grassy openings or drainages surrounded by trees.

Alternatives

In both alternatives traffic, road maintenance, and rock moving could crush individuals. No new roads are proposed in either alternative. In the preferred alternative wetland habitat will be enhanced by cleaning out three existing settling ponds and by creating a fourth pond. This should improve snake habitat.

Northern Goshawk (Accipiter gentilis)

Forest Plan Direction

Standard 3108. The following additional protective measures will apply relative to the northern goshawk for all projects involving the removal of trees in suitable habitat, except those done for the express purpose of enhancing goshawk habitat: a) A goshawk nest survey prior to any projects in forested areas. b) If the project area includes a historically active territory, this acreage will be excluded from the project. c) If a historically active territory occurs within one-half mile of the project area and protected acreage has not yet been identified, the project analysis will determine whether some of the protected acreage should occur within the project area. d) If the pre-project survey identifies a previously unknown active nest, the project analysis will determine where protected acreage will be located.

Guideline 3110 (Treat as standard). Activities should not reduce the structural and compositional integrity of active and alternative conifer-forested goshawk nest stands.

Existing Conditions

Northern Goshawk nest sites are typically composed of mature to old-growth trees with a relatively dense canopy. These stands have been characterized as 20 to 30 acres in size. A study in the Black Hills found canopy cover to range from 60 to 85 percent. Along with being in dense stands, nests tend to be near a forest opening or road. Nesting activity generally begins in early March (USDA Forest Service, 1996, FEIS Black Hill National Forest Plan).

On November 4, 2002 the area surrounding the mine site was examined for potential goshawk habitat. Adjacent to the existing mine there is less than 15 acres of potential habitat for goshawks. The canopy of the pine site is not dense enough for optimum habitat and the size of the site itself is not conducive for goshawk nesting, therefore the site was not found suitable.

No Action Alternative 1

This alternative would not require the cutting of any trees at the Brite-X Mine. The mine would only have the occasional blast, noise, which creates a more wildlife conducive environment.

Preferred Alternative 3

This alternative requires the cutting of approximately 1½ acres of pine habitat. As stated in the section discussing the vegetative habitat, the size of this pine stand and the structural stage of 4B, is not considered large enough to support a nesting goshawk and is not considered suitable goshawk habitat.

Marten (Martes Americana)

Forest Plan Direction

Guideline 3215. Prevent decrease in patch size of current or high-potential marten habitat. Increase connectivity; maintain microclimate; avoid building roads. Don't thin important connectivity habitat areas. Habitat definition: Spruce (SS 3B, 3C, 4B, 4C, 5); Also pine adjacent to above spruce stands (with ≥30 percent BA in spruce, and ≥40 percent canopy cover).

Guideline 3117. Where timber harvest activities occur in stands adjacent to potential marten habitat (spruce sites or conifer sites with a significant spruce component), maintain ~ 1 pile of woody material per 2 acres to create near-ground structure for marten prey species.

Standard 2308-b. Design vegetation management activities, including prescribed fire, to maintain ten sound logs per acre (eight logs minimum length 10 feet, 10 inches in diameter; two logs minimum length 10 feet, 20 inches diameter) to provide future den sites, resting sites, and prey habitat within areas currently occupied by martens or with high potential for occupancy.

Existing Conditions

Once extirpated from the Black Hills, marten were reintroduced in 1980 in the northern Black Hills and subsequent releases were made in Norbeck Wildlife Preserve. Marten prefer primarily mesic, late-successional white spruce habitat in the Black Hills. Low lying branches, logs, and slash piles are very important aspects of marten habitat. In the Black hills the only tree with branches extending to the ground is spruce. Marten are not usually found in stands dominated by ponderosa pine, although there is evidence that marten are using ponderosa pine stands within their territory or travel corridors. Marten show an affinity for riparian areas. This is probably due to the increased prey abundance. The average size of the marten home range is several hundred acres. The home range may increase as the spruce stand size decreases(USDA Forest Service, 1996, FEIS Black Hill National Forest Plan).

The spruce sites south of the Brite-X Mine show high potential for marten habitat. Canopy cover, logs, snags, prey species are all conducive for marten presence. The Tenderfoot Creek riparian area also adds to this habitat. If marten are present it is likely that the ponderosa pine sites surrounding the mine are within the marten territory.

No Action Alternative 1

The white spruce sites south of the mine are not impacted by the current mine operation.

Preferred Alternative 3

Under this alternative the spruce sites will not be affected. A small acreage of ponderosa pine will be cut east of the mine parking lot to accommodate the new facilities. It is

possible this cutting may occur in a marten's territory. However, it is unlikely due to the fact that the current mine operation creates disturbance and there was a lack of prey species sign in this small area. The marten, if present, may extend its home range to the south to move away from noise caused by the facility. Lighting may cause avoidance and change of territory range for this solitary nocturnal species.

Northern Leopard Frog (Rana pipiens) / Tiger Salamander (Ambystoma tigrinum)

Forest Plan Direction

There are no specific Forest Plan directions for these species but the guidelines to protect riparian areas and sensitive plants do provide for the protection of their habitat.

Existing Conditions

The northern leopard frog and the tiger salamander have suitable habitat in and around Tenderfoot Creek, French Creek, and the settling ponds at this mine.

Alternatives

Northern leopard frogs and tiger salamanders may be impacted by traffic on the access road in the Tenderfoot drainage under either alternative. In addition to the traffic risk, the preferred alternative calls for nightlights. Both the leopard frog and the tiger salamander are mainly nocturnal. These lights can impact nocturnal reptiles and amphibians. Researchers have found that artificial lighting can cause nocturnal frogs to abandon normal feeding and reproductive behavior and sit motionless when suddenly exposed. Salamanders, under certain lighting, cannot accurately navigate from one water source to the next and may delay the time of emergence (resulting in less foraging time). They may fall prey to nocturnal predators or die of exposure if they cannot reach their destination (Harder, 2002 and The Urban Wildlands Group, 2002).

Townsend's Big-eared Bat (Corynorhinus townsendii)/ Fringed-tailed Myotis (Myotis thysanodes pahasapensis)

Forest Plan Direction

Standard 3207. Protect known bat nursery roosts and hibernacula.

Existing Conditions

Caves, mines, buildings, and tree cavities are some of the locations these bats will use for roosting or hibernating. Snags are not abundant around the Brite-X Mine. There are no adits in this mine pit for bat use. Current blasting keeps bats from using this mine pit. Bats may use the area for foraging and roosting.

Alternatives

In both alternatives the blasts, vibrations, and noise may impact bats in the vicinity. Under the preferred alternative there will be more blasting and vibration, which could cause bats to abandon the area. The addition of nightlights in the preferred alternative may have a beneficial impact on bats by attracting moths to the lights creating an easy source of prey.

3.3.4 Cumulative Effects

Snags & Woody Plant Material

Under Alternative 1 snags are not being affected by grazing, logging, or the mining that is presently occurring. Alternative 1 has no affect on snags because of development of a processing facility. The mine pit will still continue to expand under alternative 1 so some snags and logs may be impacted. Mountain pine beetle infestation pockets are west of the mine site.

Under Alternative 3 the mine pit will expand. Expanding the pit may claim some snags and logs. The new facilities require 1½ acres of land and the amount of snags and logs affected during the construction are minimal.

Future timber sales will have the same effects as the past Limestone sale. Green recruitment trees will be left to replace snags lost as described in Guideline 2306. Snags would not be cut unless they are a safety hazard. Mountain pine beetles may claim some pine and increase the amount of snags on the watershed.

Snag densities in portions of the project area fall below the Forest Plan standard while other portions are above the standard. The revised standard for retention of hard snags requires that an average of 2-4 hard snags/acre greater than 10" DBH and 25' tall be left across the watershed. Where portions are below the standard, mitigation measures for green tree recruitment will help the watershed in meeting Standard 2301 in the future.

As with the snags, log densities vary greatly across the watershed. Some portions have more logs than required and others are lacking in logs. Forest Service standard 2308 calls for 50 linear feet per acre of coarse woody debris. Diameter needs to be a minimum of 10".

Mountain pine beetle infestations this year have affected numerous acres of forest. Snags are being created through the beetles. Future years may see the infestations spread to the mine site. Any wildfires should increase the amount of snags and eventually down woody material in the area.

MIS and T&E Species

Past cattle grazing has impacted riparian habitat, this includes Tenderfoot Creek and the vegetation in the drainage. Sensitive plant and animal species may have been crushed or forced to another location by cattle.

The Limestone Timber Sale affected the structural stage of the pine stands. Most of the acres close to the mine were seed cut. This affected wildlife habitat by decreasing canopy cover in the stand. Ground vegetation was affected as well by opening up the stand.

The mine has affected wildlife and plant habitat by creating a large pit and moving rock material to another location. The human disturbance, blasting, and traffic have had some direct and indirect impacts to species.

Under alternative 1 grazing cattle and Brite-X Mine are impacting habitat of MIS and sensitive species.

The preferred alternative will have impacts to wildlife and plants. Riparian habitat will increase when settling ponds are constructed. The amount of noise generated near the mine and during construction of facilities will have the greatest impacts to wildlife. Habitat will mainly be impacted at the construction site and with future expansion of the mine. Impacts are also discussed in the Biological Evaluation and in prior sections of this report.

Under future actions the mine has the potential to grow in size. Pine stands will be impacted if the pit expands. Riparian habitat will continue to receive abuse from grazing cattle.

Habitat for species associated with mature closed canopy ponderosa pine stands is limited mainly due to past timber harvest. Habitat for species associated with snags and logs is present mostly in the spruce sites south of the creek. There are sporadic pockets of snags and logs within nearby pine sites. Those species associated with riparian areas will have suitable habitat near the creek and near the settling ponds maintained by Pacer Corporation. Without the effects of a fire, storm damage, or harvest, structural stage changes within wildlife and plant habitat will be insignificant.

Sensitive Species

Any or all of the species discussed above may suffer increased impacts from selecting Alternative 3 over Alternative 1. Due to the fact that the mine is currently in operation and a range of wildlife species are present, assumptions are made that wildlife will be able to adapt to the new mine facility.

Past Actions

The mine was started in 1978 and has created a 3.5 acre pit and 2.0 acre staging area and waste rock storage area. Past actions in this area include cattle grazing, mining, and logging. Cattle have grazed this area for many years in the Tenderfoot Allotment. Impacts to the Tenderfoot Drainage are apparent. Sides of the creek have sloughed and hummocks have been created. There are old dredge piles along the creek from past mining near the water. This was not associated with the Pacer Corporation. The Limestone Timber Sale harvested pine in sites near the mine in the last three years. The closest cut was within ¼ mile of the mine site. There are old stumps from a logging several decades ago around the mine site.

Present Actions

Grazing seems to be having more of an impact to the Tenderfoot Drainage than the mine. Cattle are impacting the vegetation, possibly sensitive plants, by consumption and/or trampling. Cattle are eating choice vegetation, which decreases the amount of forage for small mammals, prey of marten, goshawks, and other predators.

The Brite-X Mine is in current operation and blasting to loosen rock is done on schedule. Material that does not travel to the mill in Custer is piled east and south of the pit. The mine pit itself is slowly expanding.

Future Actions

Pacer Corporation plans on keeping the Brite-X Mine in production for possibly the next

fifty years. The mine produces a good supply of mica. Pacer plans on increasing the production rate of mica processed by building a new processing facility. The mine pit will undoubtedly expand to the north and west if the mine is in operation for another fifty years. This expansion will mean a loss of wildlife and plant habitat. Cattle grazing will continue in the area unless fencing is undertaken. The riparian area near the creek will continue to be damaged from cattle. Future timber sales are likely to occur in the area of the mine. The access road in to the mine is on private land and it is possible this land could be developed in the future.

3.4 FISHERIES

This report analyzes the potential effects to fisheries resources due to the construction and operation of a new processing mill at the mine (preferred alternative) compared to operation of the existing mine site and processing of the mica at the Brite-X plant (no action alternative) in Custer, SD.

This analysis was conducted in accordance with the Forest Service Manual and the Region 2 (R2) supplement No. 2600-94-2. The effects analysis is evaluated based on compliance with Forest Plan direction as amended by Phase I. For all species discussed here, the project area is used for the determination of direct, indirect and cumulative effects analysis. This analysis is tiered to the 1997 Revised Land and Resource Management Plan (the Forest Plan) as amended by the Phase 1 Amendment (2001).

The cumulative impact area for this fisheries analysis is Tenderfoot Creek. The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility.

3.4.1 Field Surveys/Resource Contacts

A list of federally listed or proposed species was downloaded on November 8, 2002, from the U.S. Fish and Wildlife Service (FWS) website: (<http://southdakotafieldoffice.fws.gov/endsppbycounty.htm>). This list was updated by the U.S. Fish and Wildlife Service on August 14, 2002. No federally listed or proposed fish species occur in Pennington or Custer counties. Subsequently no additional Endangered Species Act section 7 consultation is needed for fish species because all of the alternatives would have “no effect.”

The R2 sensitive species list was published as Regional Supplement 2670-94-2, effective March 21, 1994. Currently this sensitive species list does not include any fish that occur on the Forest. The R2 sensitive species list is being updated and three fish species (finescale dace, lake chub, and mountain sucker) that occur on the BHNF are proposed to be added to the list. A prefield review of proposed R2 sensitive fish species was completed. Information from the South Dakota Natural Heritage Database (2002), South Dakota Game, Fish and Parks fish survey annual reports (1996 – 1998), the Forest Service *Selection Report: Aquatic Management Indicator Species for the Black Hills National Forest* (2001) and other information was reviewed to determine if any of these species were documented in the project area.

Five fish species were designated as Management Indicator Species as part of the Phase I Forest Plan Amendment. These species include: (1) brook trout, (2) brown trout, (3) lake chub, (4) finescale dace, and (5) mountain sucker. Brook trout were collected during fish surveys conducted by the South Dakota Department of Game, Fish and Parks (SD Game, Fish and Parks) in 1993 on Tenderfoot Creek, approximately 1.5 miles downstream of the project area.

A site visit to the proposed mica mill site on Tenderfoot Creek and the current mill site in Custer, SD occurred on October 22, 2002 as part of a multi-agency project review. In attendance were personnel from the Hell Canyon Ranger District, the Supervisor's Office, Pacer Corporation, South Dakota Department of Environment and Natural

Resources, and SD Game, Fish and Parks. A follow-up visit to the mine site was completed on November 8, 2002, with the Interdisciplinary Team hydrologist to review water quality/road-related issues.

3.4.2 Affected Environment

The project area is within Management Area 5.1 - Resource Production Emphasis. Management Areas are designated in the Forest Plan and spatially define where differing kinds of resource and use opportunities are available to the public and where different management practices may be carried out. Activities and opportunities in this management area include mineral development, livestock grazing, timber harvest, on/off-road motorized vehicles, and non-motorized dispersed recreation.

Tenderfoot Creek

Tenderfoot Creek is a first order stream that originates in T. 2 S., R. 4 E., sec. 32. It flows northeasterly before joining Spring Creek approximately four miles downstream. Flows in the project area were less than one cubic foot per second based on visual estimates on November 8, 2002. Beneficial uses identified by the State of South Dakota for Tenderfoot Creek include (1) coldwater permanent fish life propagation waters, and (2) limited-contact recreation waters.

Landownership along Tenderfoot Creek is fragmented. The majority of the stream length is in non-Federal ownership. Approximately 0.13 mile of Tenderfoot Creek immediately south of the mica mine is in National Forest System ownership. A total of 5.5 acres (mine = 3.5 acres, staging area/dump = 2.0 acres) of disturbed ground is due to the current mine site.

The mine site is accessed by an unclassified, native surface road. It is 0.8 mile from Highway 385 to the Forest Service boundary and 0.3 mile from that boundary to the mine. During the November 8 site visit, some surface erosion was evident where the road turns north away from Tenderfoot Creek, but the sediment was flowing into the inboard ditch. Further down the road, some erosion and sediment deposition had occurred from surface runoff across the road, but this material was of a negligible amount and blocked from entering the creek by a ridge of vegetated dredge spoils. No sediment was entering to Tenderfoot Creek directly off of the road or as overflow from the settling ponds. The uppermost settling pond did show signs of recent deposition but the source is the oversized waste rock stockpile immediately upslope.

The portion of Tenderfoot Creek on National Forest System land was probably mined in the 1930's. Dredge spoil piles are evident and the stream channel had been highly modified. Pacer Corporation staff report that limited gold panning/slucing has occurred in the past decade. The riparian zone has revegetated with a partial spruce overstory and a dense grass understory. The channel substrate ranged from rock and cobble to fines where reduced water velocities allowed deposition. Channel width was approximately 1.5 feet and water depth was on average less than 2-3 inches.

The project area is in the Tenderfoot Allotment. Livestock grazing occurs in the project area and on the private land immediately upstream and downstream of the project area. The streambanks in the project area were well vegetated and stable. A cattleguard exists

at the Forest Service downstream boundary and some soil disturbance is evident on the private land due to concentrated livestock use along the fence line. A new road crossing with two culverts was installed on private land in 2002 across Tenderfoot Creek approximately 50 yards upstream of the project area. Vegetation had not yet been established to stabilize the soil.

The South Dakota Department of Game, Fish and Parks has a fish-sampling site on Tenderfoot Creek immediately upstream (south) of the Pennington/Custer County line. This 100-meter (328 feet) site is approximately 1.5 miles downstream from the mica mine pit. This site was surveyed on June 16, 1993. The South Dakota Department of Game, Fish and Parks (1994) reported only brook trout (*Salvelinus fontinalis*) were collected at this site. A population estimate of 16 fish was calculated, giving a relatively low density of 160 trout per kilometer (256 trout/mile). All brook trout were subcatchable, with a mean total length of 134.6 millimeters (about 5.5 inches).

French Creek

The current mica mill is located in Custer, SD, adjacent to French Creek (T. 3 S., R. 4 E., sec. 26). Beneficial uses identified by the State of South Dakota for this portion of French Creek include: (1) coldwater marginal fish life propagation waters, and (2) limited-contact recreation waters. French Creek is a low gradient stream in the project area. The streambank is approximately three feet high and well vegetated with grasses and willows. The channel is approximately 10 feet in width and the substrate is sand and gravel. The flow in this portion of French Creek is regulated by an outflow structure at the municipal pond located on the west end of town. The regulated flow in French Creek observed in mid-November was roughly equivalent to Tenderfoot Creek in the absence of measurable rainfall.

3.4.3 Environmental Effects

In addition to the direct and indirect effects resulting from the above project, cumulative effects to fisheries resources resulting from past, present, and reasonably foreseeable future activities were assessed.

Forest Plan Direction

There is specific direction in the Forest Plan pertaining to the soil and water resource.

- Goal #1 – Protect basic soil, air, water and cave resources.
 - Objective 103 –Maintain or improve long-term stream health. Achieve and maintain the integrity of aquatic ecosystems to provide stream-channel stability and aquatic habitats for water quality in accordance with state standards.

The Forest Plan lists Standards and Guidelines for the different resources. Standards and Guidelines are used to determine if individual projects are in compliance with the Forest Plan. The following Standards and Guidelines are applicable to the fishery resources for this project:

Standard 1211. Place new sources of chemical and pathogenic pollutants where such pollutants will not reach surface or ground water.

Standard 1212. Apply runoff controls to disconnect new pollutant sources from surface and ground water.

Guideline 1506 (treat as Standard). Minimize disturbance to the riparian area by mineral activities. Initiate timely and effective rehabilitation of disturbed areas and restore riparian areas to a state of productivity comparable to that before disturbance: a. Prohibit the depositing of material from drilling, processing or site preparation in natural drainages. b. Locate the lower edge of disturbed or deposited soil banks outside of natural drainages and riparian areas. c. Prohibit stockpiling of topsoil or any other disturbed soil in natural drainages or riparian areas. d. Prohibit mineral processing (milling) activities within natural drainages or riparian areas.

Guideline 1508 (treat as Standard). Require monitoring of mining mitigative measures in riparian areas to insure that the measures are effective and in compliance with applicable water-quality standards.

The amended Forest Plan also provides general direction to conserve aquatic resources and to protect water quality rather than brook trout specific guidance. This general direction includes the implementation of Best Management Practices (BMPs), Regional Watershed Conservation Practices and adherence to riparian focused standards and guidelines.

Management Indicator Species (MIS)

The Forest Plan as amended by Phase I lists management indicator species to be considered during project planning. Based on the prefield review, brook trout have been documented in Tenderfoot Creek downstream of the project area. None of the other fish Management Indicator Species have been documented in the project area.

Brook trout are a desirable non-native fish species. Fish stocking records show brook trout being stocked in Spring Creek near Hill City in 1910 (SD Game, Fish and Parks, 1911). Early plantings may have occurred. The diet of brook trout includes fish, small crayfish, or even snails, but insects, both terrestrial and aquatic, generally make up the bulk of the forage. Brook trout spawn in the fall.

Threatened and Endangered Species – Biological Assessment

As determined by the pre-field review, no federally listed or proposed fish species occur in the project area. Subsequently no additional Endangered Species Act section 7 consultation is needed for fish species because all of the alternatives would have “no effect.”

Sensitive Species – Biological Assessment

Based on the pre-field review, no current or proposed R2 sensitive fish species will be affected by any of the alternatives. Finescale dace (*Phoxinus neogaeus*) are documented in the Redwater Creek drainage in Lawrence County (Isaac, et. al., 2002) but are not documented in Pennington or Custer County. Lake chub (*Couesius plumbeus*) are known to occur only in Deerfield Reservoir (SD Game, Fish and Parks 1999). The mountain sucker (*Catostomus platyrhynchus*) is more widespread than the finescale dace or lake chub in the Black Hills. No records were found documenting the presence of mountain

sucker in Tenderfoot Creek. Surveys conducted on French Creek in 1996 upstream of the Custer Municipal Pond (SD Game, Fish and Parks, 1997) and in 1994 and 1984 approximately 3.5 miles downstream of the existing mica mill did not detect mountain suckers (SD Game, Fish and Parks, 1995). Mountain sucker are documented in French Creek downstream of Stockade Lake near Blue Bell (SD Game, Fish and Parks, 1997), approximately eight miles downstream of Custer. No facilities exist at Stockade Dam to allow fish to move upstream past the dam.

Determination and Rationale

Currently no R2 sensitive fish species exist on the Forest, therefore both the no action alternative and the preferred alternative will have “no impact” to R2 sensitive fish species. The no action alternative and the preferred alternative would have “no impact” to the three fish species proposed for addition to the R2 sensitive species list because none of these species are known to occur in the project area.

No Action Alternative 1

Under the no action alternative, fisheries impacts would not occur on Tenderfoot Creek. Sediment from mining operations would be trapped in the settling ponds. Sediment from the access road would also be trapped in settling ponds, be deposited in the inboard ditch, or get filtered out in the dense vegetative groundcover. The mine itself serves as a trap for sediments created from drilling, blasting and extraction. The parking area would remain unpaved, allowing any petro-chemical drips/spills from mining equipment or vehicles to leach into the ground.

Floodwaters that exceed bankfull capacity on French Creek may wash stockpiled waste material into the creek from the Custer mill site. These events are likely to be infrequent and of short duration.

Continued operation of the mine and use of the mill in Custer would have no impact to brook trout. No visible sediment input is currently entering Tenderfoot Creek from the mining operation and mine/road sediment input is not predicted in the future. The disturbed area of the mine drains into itself. The existing settling ponds trap any sediments from the oversize tailing pile and any road sediments would flow into the inboard road ditch or would settle out prior to entering the creek. No brook trout are documented in French Creek near the existing mill, therefore not impacts would occur.

Preferred Alternative 3

Construction of the mill would result in an additional 3.25 acres of temporary ground disturbance. Sediment runoff during construction would be avoided by the installation of silt fencing to trap sediments above and below the construction area and vegetation would be reestablished on bare soil to prevent further surface erosion once construction is complete.

Paving the parking area would create an impervious area of about one acre. Petro-chemical drips/spills originating on the parking area would be directed to the settling ponds and would be contained using a spill control separator with oil absorbent bags. These measures would prevent the introduction of these contaminants into Tenderfoot Creek.

Road betterment, the installation and maintenance of four culverts and the maintenance of the settling ponds would ensure sediments are not entering Tenderfoot Creek.

The mill on French Creek would be closed and the structures would be removed. The mine material would also be removed, eliminating this as a source of sediment input into French Creek during flood events.

Project features to avoid sediment input and water quality impacts from chemical contaminants would eliminate impacts to brook trout in Tenderfoot Creek. Sediment inputs that may reduce prey availability, foraging conditions or spawning habitat for trout would not occur.

3.3.4 Cumulative Effects

Under both the no action alternative or the preferred alternative, livestock grazing is expected to continue at current levels on Forest Service lands as allowed under the Tenderfoot Grazing Management Plan. The Decision Notice for this allotment was signed in 1997 and it is unlikely that it will be revised prior to 2010. The future grazing intensity on adjacent private lands is unknown. Recreation uses such as fishing, hunting, gold panning, and on/off-road motorized/non-motorized use are expected to be minimal or nonexistent. A “Keep Out” sign is posted at the private property boundary immediately off of Highway 385 and a locked barrier stops vehicle passage across the road during non-operation of the mine. The maintenance, use or the development of private roads along Tenderfoot Creek may affect water quality upstream or downstream of the project area.

Under both the no action alternative and the preferred alternative, livestock grazing would continue at current levels. Given the short length (0.13 mile) of Tenderfoot Creek in the project area and the existing good riparian condition at current grazing levels, impacts to brook trout from grazing would be negligible. Livestock grazing on adjacent private lands, especially upstream may contribute sediments that get deposited in the planning area. These sediments would be mobilized and moved downstream dependent of instream flows. Fishing pressure in the project area is probably non-existent and would not impact the brook trout population.

3.5 RANGE

3.5.1 Affected Environment

The proposed mill site is located within the Tenderfoot Allotment. Gladwin Paulsen and Mitch Paulsen both have grazing permits in that area of the allotment. They ran a total of 223 pairs of cattle for the June 1, 2002, to September 30, 2002, grazing period. The cumulative impact area for this analysis is the Tenderfoot Allotment. The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility.

3.5.2 Environmental Effects

The no action alternative would leave conditions as they currently exist. There would be no significant impact to the grazing in the allotment from the proposed activities. The preferred alternative would place the mill at a site within the allotment. A small amount of forage may be lost, but the amount lost would not be enough to have an impact on the grazing of the allotment. No significant impacts to the grazing in the allotment are foreseen from placing the processing plant next to the existing pit.

3.5.3 Cumulative Effects

None of the alternatives considered would have more than a minimal effect on grazing over the life of the proposed activity.

3.6 HERITAGE RESOURCES

Historic properties have been taken into consideration regarding the Brite-X Mica Processing Facility project pursuant to section 106 of the National Historic Preservation Act. An intensive survey has been conducted in the project area. One archaeological site, eligible for inclusion in the National Register of Historic Places is located in the project area. This historic property will not be affected by this undertaking. The South Dakota State Historic Preservation Office and concerned Native American governments have had the opportunity to comment on the proposed undertaking. The South Dakota State Historic Preservation Office concurs with the Forest Service submission regarding the project. The Standing Rock Sioux Tribe does not feel the need to review this project any further. The Forest Service has not received comments from other tribal governments at this time regarding the Section 106 submission. There are no anticipated cumulative affects to the archaeological site.

3.7 RECREATION

The cumulative impact area for this recreation analysis is defined as all Forest System land west of Highway 16/385 in Sections 27 and 28 of T. 2 S., R. 4 E. This area was chosen because it represents all the land that is reasonably accessible by foot or horseback from the existing road system that surrounds this area. The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility.

3.7.1 Affected Environment

The area surrounding the Brite-X mine is classified as Roaded Natural in the Recreation Opportunity Spectrum. Road Natural is defined in the Forest Plan as an area characterized by predominantly natural appearing environments with moderate evidence of the sights and sounds of people. The Oreville Forest Service Campground is located approximately three miles northwest of the Brite-X mine along Highway 16/385. The Black Elk Wilderness, Norbeck Wildlife Preserve, Peter Norbeck Scenic Byway, Mt. Rushmore, and Custer State Park are located approximately three to four miles east of the Brite-X mine.

There are no special use recreation permit holders within the vicinity of the project area. There is no direct access to the Brite-X mine or surrounding area using the Forest road system, consequently, road based recreation opportunities are not available. There is no evidence of off-road vehicle use in the area. Hunting opportunities do exist for turkey, grouse, and deer in the area surrounding the Brite-X mine. Employees at the mine have indicated that hunters have occasionally been seen in the area surrounding the mine. There is no other evidence of any other non-motorized or motorized recreation users within or near the Brite-X mine.

3.7.2 Environmental Effects

No Action Alternative - 1

There would be no effect to the existing recreation opportunities under the no action alternative.

Preferred Alternative - 3

The general effects to recreational users are minimal because of the difficulty of accessing the area. Hunters are currently the only recreation user group affected by this alternative. During the construction of the processing facility there would be increased road traffic along the access road and at the mine site. Once the processing facility is in operation the activity at the mine site and along the access road, activities will decrease but still be above the existing conditions identified in the no action alternative. This effect will not substantially affect the quantity, quality, or type of hunting opportunities available to this user group because of the hunting opportunities available elsewhere in the Forest. There are also no indirect, direct or cumulative effects to the Oreville Forest Service Campground, Black Elk Wilderness, Norbeck Wildlife Preserve, and Custer State Park because of the distance from the proposed processing facility.

3.7.3 Cumulative Effects

The cumulative effects from the implementation of the no action and preferred alternatives are that the mine will slowly expand over the 50 year time period. While this activity has been approved through a prior EA it may indirectly affect the existing recreational hunting opportunities by the removal of additional wildlife habitat during this 50-year period. Pacer Corporation is required to reclaim all disturbed areas at the mine, including the proposed processing facility, so this effect is limited to the duration of mining activities.

3.8 SCENIC RESOURCES

This section is intended to address the scenic impacts of locating the Brite-X Processing Plant on Forest Service system lands. The site is located within a forested area, adjacent to a large meadow and private land, approximately $\frac{3}{4}$ to 1 mile off US Highway 16/385, approximately 6 $\frac{1}{2}$ miles north of Custer, South Dakota. Access is through a road on private land. The cumulative impact area for this analysis is the 40-acre water shed of the Brite-X mine (See Soil and Water section). The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the processing facility.

3.8.1 Affected Environment

Landscape Character

Landscape character gives a geographic area its visual image and consists of the combination of physical, biological, and cultural attributes that make each landscape identifiable or unique. Landscape character embodies distinct landscape attributes that exist throughout an area. The site is located within the Moderately Dissected Terrain / Mixed Forest Landscape Character Unit. Landscape use patterns in this area transition from natural appearing to rural – pastoral/agriculture. Evidence of management activities are subtle in this area. Suppression of wildland fires have resulted in a denser forest, which is helping to hide other activities (roads, mining, vegetation management, mineral exploration/removal, vehicle access/movement) (see the 1997 Revised Land and Resource Management Plan, Appendix B-47 thru B-54)

Mountainous / Mixed Forest Landscape Character Unit:

This combination of rock, water, and trees capture the aesthetic qualities that make the Black Hills a popular place to vacation. The recreational impacts are not evident as one travels this region. This site is located west of US Highway 16/385, as well as the Mickelson Bike Trail.

The features associated in this landscape, include numerous hills that are the surface expressions of intrusive magmas, doming up the overlying sediments. The site is in an area that is at the lower elevations (5760 ft.) which is characterized by rolling hills covered with Ponderosa pine and aspen stands interrupted by meadows and narrow streams lined with grasses or hardwoods.

Ponderosa pine is the predominant tree species, covering more than 80 percent of the area. Composing perhaps the most striking vegetation throughout this landscape are the mature Ponderosa pine trees that majestically tower over the road corridors and hillsides. Spruce, Aspen, other hardwoods, and meadows comprise the remaining 20 percent. During the spring and fall, these hardwoods present a flush of color that dominates the landscape.

Human use is scattered throughout the area, however, the Brite X open pit mine is directly adjacent to the site. Most dispersed recreation occurs in the spring and fall during turkey, deer, and elk hunting seasons. Access in this area is limited for recreational hunting as access is thru private lands.

Visual Absorption Capability

Visual Absorption Capability is the ability of an area to withstand management manipulations without significantly affecting its visual character. The Brite-X processing facility site has a moderate to low Visual Absorption Capability, this indicates that the area has a lower than average capability to absorb resource management activity alterations without changing the scenic appearance.

Inherent Scenic Attractiveness

Scenic attractiveness is obtained by classifying the landscape into different degrees of variety. This determines those landscapes, which are most important and those, which are of lesser value from the standpoint of scenic quality. The classification is based on the premise that all landscapes have some value, but those with the most variety or diversity have the greatest potential for high scenic value. The combination of valued landscape elements such as landform, water characteristics, vegetation, and cultural features are used in determining the measure of scenic attractiveness.

Scenic attractiveness classifications are: Class A – Distinctive; Class B – Typical; and Class C - Indistinctive. Class A refers to those areas where landform, vegetative patterns, water characteristics and cultural features combine to provide unusual, unique or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, order, harmony, uniqueness, pattern and balance. Class B refers to those landscapes where landform, vegetation patterns, water characteristics and cultural land use combine to provide ordinary or common scenic quality. Class C refers to those landscapes where landform, vegetation patterns, water characteristics and cultural land use have low scenic quality. Often water and rock form of any consequence are missing in class C landscapes. The Brite-X processing facility site has a Class B - Typical classification.

Seen Area/Sensitivity

Travelways are identified and classified in order to determine which existing observer positions to use in the landscape visibility analysis. Travelways represent linear concentrations of public viewing including freeways, highways, roads, railroads, trails, rivers and other waterways. Portions of the landscapes visible from travelways are important to constituents for their scenic quality, aesthetic values and landscape merits. Travelways that lead to important scenic features, residential areas, resorts, recreation areas, unique natural phenomena, wilderness trailheads, national parks, state and county parks, attract higher percentage of users having high concern for scenic quality, thus increasing the importance of those travelways.

There is one Sensitivity Level 1 Travelway near the Brite-X processing facility site, US Highway 16 / 385. As mentioned above, the mill site is approx. $\frac{3}{4}$ to 1 mile west of the site. In addition, the Mickelsen Trail parallels the highway, and also is a travel corridor with high public concern for the scenery evident from this trail. The site is not visible from these travel corridors, as it is blocked from view by topography.

Inventoried Scenic Classes

The inventoried Scenic Class values are 1, 2, 3, and 4. The scenic class values demonstrate the importance of the views in different areas. The Brite-X processing facility site is in an area of Scenic Class 3.

Scenic Integrity Objectives

Scenic Integrity Objectives were adopted from the scenic class values. Areas with high Scenic Integrity Objectives should appear natural. Areas with moderate Scenic Integrity Objective should appear only slightly altered from the more natural appearing forest; spacing and age diversity is not as important as in areas of high Scenic Integrity Objective. Areas with low Scenic Integrity Objective should appear moderately altered with management deviations becoming more noticeable. The Brite-X processing facility site has a low Scenic Integrity Objective.

Existing Scenic Integrity

Existing scenic integrity represents the current status of a landscape. It is determined on the basis of visual changes that detract from the scenic quality of the area. Direct human alterations may be included if they have become accepted over time as positive landscape character values. Existing scenic integrity is the current visual state that is measured in degrees of deviation from the natural appearance of the landscape character type. These ratings give an indication of the present level of visual quality and visual evidence of management activities. The frame of reference for measuring achievement of scenic integrity levels is the valued attributes of the existing landscape character unit being viewed. In natural or natural appearing character this is limited to natural or natural appearing vegetative patterns and features, water, rock and landforms. Human alterations in the form of mine access road, which is overgrown with grasses, past mineral removal, and vegetation management, is apparent as alterations in the landscape. The existing scenic integrity of the Brite-X processing facility site, and the surrounding land which includes the Brite-X open pit, is low.

Forest Plan Management

The Brite-X processing facility site is located within management area 5.1 Resource Production Emphasis. The Scenic Integrity Objectives adopted for the different management areas are shown on the Scenic Integrity Objective map (USDA Forest Service, 1997, Black Hills National Forest Land Resource Management Plan – Revised).

Desired Future Condition

The Brite-X processing facility site is located in the general forested area. The importance of maintaining Scenic Integrity Objectives in the general forest areas has intensified with both the increase in private lands with residential developments and forest visitors traveling the back roads for pleasure. The management of this area, although in 5.1 Resource Production Emphasis Management Area, should attempt to protect and enhance scenic and vegetative diversity.

Scenic Issues / Enhancement Opportunities

A site visit by the Landscape Architect, Interdisciplinary Team Leader, Hydrologist, and a Pacer Corporation Representative was completed on October 4, 2002. A location was found that within the area of consideration that would locate the processing facility among the trees in such a manner that the earthwork would be significantly less than the original proposal. Findings on the field trips were included in the proposed alternative.

3.8.2 Environmental Effects

Forest Plan Goals And Standards

One of the Goals identified in the Forest Plan is to maintain, protect and if possible enhance the aesthetic values of the forest. There are no specific directions within the Forest Plan goals that address mining operations within the Forest.

Standard 1516. Negative recommendations or consent denials will be based on consideration of the following criteria for areas with: b) Low visual absorption capability that prevents reclamation to established Scenery Integrity Objectives.

To accomplish the above goals the general forest plan direction for scenic resources requires that the Scenery Management System be applied to all National Forest System lands. The SMS methodology is detailed in Agricultural Handbook 701. Specifically, the Forest Plan requires project activities meet adopted Scenic Integrity Objectives (SIO). Existing SIO's are determined by field inventories, GIS analysis, then mapped in GIS. If the Forest Plan mapped scenic integrity objectives need to be modified to meet management objectives, the scenic integrity objective can be modified if the change is warranted and documented.

No Action Alternative

This alternative would not construct the processing facility at this location. The mine, which is currently not readily visible from the surrounding properties, would continue with this level of visibility. There would be no change in the existing level of effects of the mining operation. The Scenic Integrity of the site would not change.

Proposed Action Alternative

This alternative would construct the processing facility along the east side of the mine access road, directly across from the quarry. First, clearing the building site of trees and stumps would occur, then a level building pad and access road would be constructed, followed by the mill structure and overhead conveyor system.

Direct Effects

Portions of the forest will be removed and a level pad for the processing mill and vehicle parking will be created. There will be a loss of vegetation, but the view from the mine access road will be limited by the existing landform and trees between the road and the processing facility. The landform between the Highway 16/385, adjacent private land and the processing facility will not be affected, and will continue to block the mill site and mine from being visible. The processing facility, like the existing mine site, will be

evident from a superior position, such as an observer in an aircraft.

Earthwork for the pad will create cut and fill slopes, where the soil will be exposed until vegetation is established – normally up to three months for flatter slopes such as 4:1; however it can take years on steeper slopes such as $\frac{3}{4}$:1. These slopes likely will be evident from the earth color of the base soil (until vegetation is established) and lighting (since the overhead tree canopy, that could provide shade and help obscure the slopes, will be eliminated). This will be the case during, and immediately after construction, until the grasses & forbs can become established.

Although the buildings and earthwork will have limited visibility from the mine access road, the conveyor system, depending upon its height above the ground maybe more evident. The conveyor will not be hidden by landform, but there is a screen of trees between the road and the conveyor. As a result, the conveyor is expected to be partially hidden by trees and other vegetation. The conveyor will create a strong horizontal line that parallels the existing foreground (meadow/settling pond). The trees create vertical movement and, with their coarse texture, will help breakup the horizontal conveyor's appearance. If the processing plant operates at night the lights will only be visible to the adjacent Case Estate property.

The proposed activities should meet the low Scenic Integrity Objective of this area.

3.8.3 Cumulative Effects

Past activities that have effected the scenic resources within and adjacent to the Brite-X mine include vegetation management and mining. Vegetation management in the form of timber harvest, salvage, and hardwood restoration with generally limited visual impacts; however, these activities shaped/modified the vegetative patterns we perceive in the landscape. Historical mining activities have also shaped/modified the landscape but in general are limited to less than 5 acres in size and natural regeneration has partially reclaimed many of these sites.

Ongoing resource management projects occurring within and adjacent to the Brite-X mine were designed utilizing scenic resource management principles and the standards and guidelines from the Forest Plan.

Future resource management activities will include the vegetation management activities and mining. The Brite-X mine will continue to expand within the Brite-X watershed (see Soils and Water section). As long as the mining activities remain within this watershed the surrounding landforms should mitigate the impacts to the adjacent visual resources. The greatest scenic impacts will occur when the mining activities approach the topographic crest of the watershed and them may be visible from other areas. All surface impacts to Forest System land will be reclaimed upon the completion of mining activities as stipulated in the Plan of Operations for the Brite-X mine and the processing facility.

3.9 LAND RESOURCES

The cumulative impact area for this land analysis is defined as all Forest System land west of Highway 16/385 in Sections 27 and 28 of T. 2 S., R. 4 E.. The cumulative impact area also includes the private homes adjacent to Highway 16/385 located 0.75 miles east of the proposed processing plant. The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility.

3.9.1 Affected Environment

The private land immediately south of the Brite-X mine is administered by the Myrle Case Trust Wells Fargo PCC Trustee (hereafter identified as the Case Estate). Pacer Corporation has a legal easement to use the access road on the Case Estate. Approximately 30 vehicular trips (round trips) will be completed by Pacer Corporation each week under the no action alternative. Up to 130 vehicular trips will be completed each week with the preferred alternative. This access road will remain gated under both alternatives and will not be accessible to the general public. The intersection of Highway 16/385 and the access road has been identified as a safety concern because it may not meet the legally required sight distances for southbound traffic.

The next closest parcels of private land are located $\frac{3}{4}$ of mile east of the Brite-X mine adjacent to Highway 16/385 in the Tenderfoot Creek drainage. A total of ten homes have been built within this subdivision and eight of these are full time residences. Five of these homes are located to the north of the access road and they do not have a direct physical or visual connection with the highway or the entrance to the access road. The other five homes are located directly across from the entrance to the access road. These homes have a direct physical and visual connection to the entrance of the access road and the highway. A helicopter tourism company is also located adjacent to these homes. They have a heliport and operate one helicopter during the summer months.

A new underground power line will be developed along the west side of Highway 16/385 to replace the existing power line that is currently present along the east side of the highway. Pacer's proposed overhead power line is approximately 4000 feet (0.75 miles) and will tie into this main line. Black Hills Electric Cooperative will supply the power and the route has been reviewed by members of the Interdisciplinary Team (See Figure 2 for location). The 24.9/14.4 kV overhead power line will be set on a single 40-foot pole in the center of a 30 right-of-way. The total acreage of disturbance is approximately 2.75 acres and this area has recently been logged. The corridor along Highway 16/385 has a high Scenic Integrity Objective while the remainder of the proposed route to the proposed processing facility has a low Scenic Integrity Objective.

3.9.2 Environmental Effects

Forest Plan Direction

Standard 8303. Bury new or reconstructed electrical utility lines of 33 kilovolts (KV) or less and telephone lines, *unless one or more of the following applies*: a) Scenic integrity objectives of the area can be met using an overhead line; b) Burial is not feasible due to geologic hazard or unfavorable geologic conditions; c) it is not technically feasible; or d)

greater long-term site disturbance would result.

Standard 8304 (Guideline but treat as standard). Reduce effects of utility corridors: a) Locate new and rebuilt (greater than 33 KV) utility lines so they are not highly visible from the highways; b) Locate new and rebuilt (greater than 33 KV) utility lines to cross at right angles to the travel corridor; and c) Use non-reflective material in construction of overhead utility lines within travel corridors.

No Action Alternative 1

The existing Pacer traffic will continue to use the access road and the existing conditions at the intersection of Highway 16/385 will continue to remain in place. The Case Estate will continue to let Pacer Corporation use the access road as stipulated in the road easement. The five households located directly across from this entrance will see no change in the traffic conditions that are currently present. People using Highway 16/385 will see no change in the existing landscape because no power line will be built with this alternative.

Preferred Alternative 3

This alternative will increase the amount of traffic along the access road, increase the number of vehicles using the intersection of Highway 16/385, and will increase the amount of traffic impacts to the five households located directly across from the entrance to the access road. The overhead power line may create a brief visual impact for people using Highway 16/385. Since this area has recently been logged only a small number of trees will need to be cut to build the overhead power line.

3.9.3 Cumulative Effects

No Action Alternative 1

Under this alternative mine trucks would still haul the mica ore to processing facilities located in Custer, South Dakota. This means that loaded ore trucks will still be using the access road across Forest System and Case Estate land as well as Highway 16/385. With the anticipated increase in Black Hills tourism there may be conflicts in the summer months between tourists and the loaded ore trucks using the highway. The five homes located directly across from the entrance to the access road should see no cumulative effects from this alternative. There are also no cumulative effects if the proposed power line is not built.

Preferred Alternative 3

With this alternative there will be a larger number of vehicles using the mine access road. Loaded ore trucks will no longer use the highway and be replaced by highway trucks transporting finished mica product. These vehicles have larger engines and may increase the amount of noise heard by the five homes located directly across from the access road. These vehicles may also create a safety hazard for southbound traffic along Highway 16/385 when they enter the highway. The Case Estate may also need to require that Pacer Corporation upgrade the access road across their land to handle the heavier vehicles using the road. The proposed power line should have no cumulative effects.

3.10 MINERALS

The cumulative impact area for this analysis is the Brite-X watershed defined by the Forest Service hydrologist (See Soil and Water resources). The timing limit for the cumulative effects analysis is the proposed 50-year operational period of the proposed processing facility.

3.10.1 Affected Environment

Mineral Activity

The only current mineral activity is being completed by Pacer Corporation at the Brite-X mine. They currently hold a total of 19 unpatented mining claims in and around the Brite-X mine. The mineral activity in the vicinity of the Brite-X mine has historically been very low. Pacer Corporation has reported limited placer gold mining activity at Tenderfoot Creek in the 1970's but there has been no other activity since that date. It is anticipated that there is a very low probability of future mineral activity in the project area.

Abandoned Mines

There are no abandoned mines identified in the Abandoned Mine Land Database near the project area (Webb, C., et al, 1998) but the Grand Junction abandoned mine is located to the ½ mile to the west of the Brite-X mine on Forest System land. At this point in time there are no anticipated effects to the environment from the historical placer mining activity that has occurred along Tenderfoot Creek.

Mineral Recreational Opportunities

The only potential recreational activity for the project area may be the few individuals who attempt to pan for gold in Tenderfoot Creek. No free use permits have been issued for the collection of rocks in the vicinity of the Brite-X mine.

Mineral Resources

Mica has been mined from pegmatite dikes from the early 1900's in the Black Hills and is an important industrial mineral. The mica schist that is mined by Pacer Corporation is part of the Archean and Proterozoic age granites, schists, gneiss, pegmatites, slates and amphibolites of the central core of the Black Hills. This schist is a major lithologic unit and outcrops of this unit have been traced from just south of the Brite-X mine north into the Hill City quadrangle (Redden, 1968). The unit averages approximately 1 mile in width, 18 miles in length, and may reach up to 2000 feet in thickness. Pacer is currently mining an area rich in muscovite mica with an extremely low percentage of contaminants. The Brite-X mine is currently the only producing mica mine in the Black Hills. The numerous products derived from this mica mine are numerous. Mica is used as a FDA approved food additive, in the cosmetic industry, as a sound dampening agent in the construction of automobiles, in paints, sheetrock, and many other areas.

3.10.2 Environmental Effects

Forest Plan Direction

The Forest Plan designates the following management area for Brite-X Mine:

5.1 RESOURCE PRODUCTION EMPHASIS

Theme – These areas are managed for wood products, water yield, and forage production, while providing other commercial products, visual quality, diversity of wildlife, and a variety of other goods and services. Numerous open roads provide commercial access and roaded recreational opportunities, while closed roads provide non-motorized recreational opportunities

The multiple-use goals established by the Forest Plan for the management of the Forest as it relates to caves and mining operations include:

Goal 1: Protect basic soil, air, water and cave resources.

Goal 3: Provide for sustained commodity uses in an environmentally acceptable manner.

Goal 8: Promote rural development opportunities.

Each of these goals have specific objectives outlined in the Forest Plan.

Goal 3 – Objective 308: Ensure that exploration, development and production of mineral and energy resources are conducted in an environmentally sound manner so that they may contribute to economic growth and the national defense.

Goal 8 – Objective 804: Coordinate with local communities to recognize local goals to maintain desired life styles and social values to participate with and provide appropriate assistance to development groups, and to be a reliable partner in giving sufficient advance notice about potential changes that may affect local economics.

The standards for mineral and energy resources outlined in the Forest Plan include the following.

Standard 1501. A Plan of Operations shall contain proposed reclamation objectives and practices to maintain water quality and soil stability during mining and exploration activities, including post mining and exploration, and any temporary shutdowns. Reclamation objectives should include the planned uses of the management area or reasons why these uses can no longer be achieved.

Standard 1502. Reclamation will be considered satisfactory when the disturbed area has been reclaimed in accordance with the operating plan.

Standard 1505. Utilize existing regulations and policies to minimize effects of mineral extractions in riparian areas. If reclamation is not done concurrently, reclamation of mined areas will begin immediately following mining activity. Reclamation will follow existing landform and vegetative characteristics as much as feasible, unless management objectives require otherwise.

Standard 1506. Minimize disturbance to the riparian area by mineral activities. Initiate timely and effective rehabilitation of disturbed areas and restore riparian areas to a state

of productivity comparable to that before disturbance. a) Prohibit the depositing of material from drilling, processing or site preparation in natural drainages. b) Locate the lower edge of disturbed or deposited soil banks outside of natural drainages and riparian areas. c) Prohibit stockpiling of topsoil or any other disturbed soil in natural drainages or riparian areas. d) Prohibit mineral processing (milling) activities within natural drainages or riparian areas.

Guideline 1507 (Treat as Standard). Confine heavy equipment use in riparian areas to areas necessary for mineral extraction.

Guideline 1508 (Treat as Standard). Require monitoring of mining mitigative measures in riparian areas to insure that the measures are effective and in compliance with applicable water-quality standards.

No Action Alternative 1

Under the no action alternative the existing mining activities will continue under the existing Plan of Operation. The processing of the mica rich ore will continue in Custer, South Dakota.

Preferred Alternative 3

Under this alternative mining will increase at the Brite-X mine. This increase in activity is still approved under the existing Plan of Operation. The development of a processing facility at the mine will reduce total operating costs and may allow the development of mica ore that is currently not considered economic. Specifically, the new processing facility will allow the processing of the coarse mica stockpile, which will eliminate one waste rock stockpile. The by-products from the processing plant will also be used in the reclamation of the mine site.

3.10.3 Cumulative Effects

No Action Alternative 1

The mine will continue to expand with the development of the mine over the 50-year time period. Disturbed land will be reclaimed and new land will be disturbed and developed. The cumulative effects would be a larger open pit mine that will require final reclamation.

Preferred Alternative 3

Most of the cumulative effects from this alternative have already been described in other resource areas. The development of a processing facility at the site will increase the Brite-X mines rate of expansion over a 50-year period. The addition of 1.5 acres of disturbance to construct the processing facility will add to the total amount of disturbed land that will require final reclamation.

4.0 CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, state and local agencies, tribes, and non-Forest Service persons during the development of this environmental assessment:

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